amateur radio

Vol. 39. No. 9

SEPTEMBER 1971

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amateur radio

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CONTENTS

FEDERAL COMMENT:

CUSTOMS DUTIES

The Commonwealth of Australia sets a customs tariff rate of 45% on the f.o.b. value (or in some cases, the current domestic value) of nearly all Amateur equipment originating in countries other than the United Kingdom and certain other Commonwealth countries. In the case of these preferential countries, a rate of 27½% is applicable. To these Customs Duties must be added sales tax, the general rate being 27½%, which is payable on the sum of the customs value plus the customs duty plus 20%.

For many years the Wireless Institute of Australia has believed that these duties and taxes are far too high and the Federal Council has repeatedly reaffirmed the Institute policy to seek a reduction in both Customs Duties and Sales Tax.

Over the years numerous attempts have been made to obtain reduced rates. These attempts to date have been totally unsuccessful, though occasional by-law applications have been successful. I would refer you to the article on customs duty that appeared on page two of the September 1967 issue of "Amateur Radio". This details the case put forward at that time to the Minister and the various matters that were taken into consideration.

At that time it seemed that the Institute was on the verge of success. Unfortunately this application was again rejected.

During 1970 various individuals submitted cases to the Minister in respect of isolated importations and a number of ad hoc concessions were granted under the by-law provisions of the customs tariff. Some of these individuals have co-operated with the Federal Executive through their Divisions by making available copies of the relevant materials relating to their individual cases. The Federal Executive has devoted a considerable amount of time since these ad hoc decisions were made to the question of customs duty, as it seemed from them that the time was again right for the submission of a general case.

There is sometime, I think, some misunderstanding on the application of the customs tariff and the imposition of sales tax. In this issue there is an article by Peter Dodd, VK3CIF, the Federal Manager, outlining the mechanics by which customs duties are imposed and setting out the present position in this country.

In the past the Institute's case has been directed to the application of the by-law provisions. Because one manufacturer of s.s.b. equipment has maintained that he could produce Amateur equipment, our case has failed. It seems to me that the law in this area is less than satisfactory for the Customs Department does not seem to be required in any case to make a value judgment of the legitimacy of the assertion made by the local manufacturer when opposing by-law entry. In the case of the manufacturer to whom I have referred, it would appear that his commercial interests are directed to other channels. He has never, to my knowledge, advertised the availability of Amateur Radio equipment manufactured by himself. I believe that this manufacturer has, over the years, not changed his position either in relation to opposing by-law admission of foreign manufactured Amateur equipment, or, in manufacturing Amateur equipment himself. It is significant that in the period 1966-1967, when the Institute investigated the claims of numerous local manufacturers of electronic equipment, no manufacturer except this one, purported to offer anything for Amateur use. This manufacturer did, in fact, give a quotation at a price that was so high that one could fairly assume that it was for the production of a single piece of equipment.

Earlier this year it appeared as if a breakthrough had been achieved by a local importer, for he advertised significantly reduced prices. It may be reasonable to assume that this importer received a by-law concession, though, noting the lack of follow up advertising, it is also reasonable to assume that this concession was withdrawn.

The Federal Executive has made further enquiries and believes that the manufacturer to whom I have referred to above, again blocked the attempts by suppliers of overseas manufactured equipment to Amateurs to secure concessions.

Very relevant in this context is that a second local manufacturer is about to produce and release on the Australian market, commercially designed Amateur Radio equipment. We do not know, of course, the price structure of this equipment, or indeed when it will be delivered. No doubt, however, this manufacturer would claim to have a legitimate objection to the admission under by-law of foreign made equipment in competition with his equipment.

Whatever are the claims of a local manufacturer for protection, the Institute firmly asserts that the present customs tariff and sales taxes imposed on Amateur equipment are too high.

The Institute believes that the Amateur market (which is a relatively small market in any event) can justify special concessions by the very nature of the Amateur Service itself. The loss of revenue involved would be infinitesimal and the Institute believes that it has a proper case to put in this area.

We are given heart in our present efforts by the apparent change in attitude to the tariff rates evidenced by various press statements made in recent times by the Minister for Customs and others. It seems from these statements that many people believe that the present protective rate platforms are too high. If these investigations enter the field of electronics, probably the main concentration will centre on broadcast and television receivers and the various items of mobile equipment used commercially. No doubt severe pressure can be expected to maintain existing levels in the face of overseas price levels for these types of apparatus. Whatever the result in the commercial field, the Institute maintains that Amateur equipment does, and should, fall into a separate category justifying substantially reduced rates of duty and tax. The Institute, on behalf of all Amateurs, will ensure that the best possible case will be submitted.

—MICHAEL J. OWEN, VK3KI,
Federal President, W.I.A.

HOME STATION ANTENNA FOR 160 METRES

Part Five—Inverted "L" and Sloping Antenna

J. A. ADCOCK, M.I.E. (Aust.) VK3ACA*

In general this type of antenna will produce mainly vertical polarisation and a little horizontal polarisation. It will produce more horizontal polarisation than an antenna with a balanced top. This type of antenna has been dealt with last as some of the conclusions depend upon earlier results.

For the purpose of discussion we will consider the antenna shown in Fig. 18. Consider the vertically polarised component of Fig. 18a. The form factor of the current on the vertical section = 0.9 (Fig. 7).

From equation (6)

$$R_R = 98.75 \times (0.5 \times 0.9)^2$$
$$= 20 \text{ ohms.}$$

Considering the horizontal section, the form factor in relation to the base can be worked out as follows:

$$F = \frac{\text{Average Current}}{\text{Base Current}}$$

From Fig. 6

$$F = \frac{1 - \cos a}{\text{radian } a \times \sin (a + b)} \quad .. \quad (13)$$
$$= 0.373$$

The radiation resistance of the top section at the base of the antenna will be:—

$$R_R = 98.75 \times (0.5 \times 0.373)^2$$
$$= 3.44 \text{ ohms.}$$

This resistance will be reduced by the presence of a perfectly conducting ground by a factor of 0.42 (Fig. 15).

$$R_R = 3.44 \times 0.42$$
$$= 1.45 \text{ ohms.}$$

Above a perfectly conducting ground, considering horizontal radiation as loss,

$$\text{Vertical efficiency} = 20 \div 21.5$$
$$= 0.93 \ (93\%)$$

From Part Four, the resistance, including radiation and loss, is equal to the free space resistance above a lossy ground, then—

$$\text{Vertical efficiency above a lossy ground} = 20 \div 23.4$$
$$= 0.855 \ (85.5\%)$$

The above, of course, are maximum efficiencies and do not include antenna loss. The proportion of horizontal radiation to vertical radiation in both cases is—

$$1.45 \div 20 = 0.072.$$

Comparing the inverted "L" with the "T" it is obvious that the radiation from the top in both cases is small. The horizontal component and the loss from the top will be greater in the case of the inverted "L". The inverted "L" top will have a greater capacitance load for a given total length than the "T" (Fig. 9).

For example, in the case in question as an inverted "L" X_c = 600 ohms, in the case of a "T" with the same length top X_c = 700 ohms (not a large difference). It can therefore be considered that the top section in both cases is only a load and not a radiator.

Consider the sloping antenna in Fig. 18b and take the vertical component first. The current distribution on the effective vertical component of the antenna will be the same as that of an antenna equal in length to the whole wire (sinusoidal), but the effective height will be equal to that of the end of the antenna. In this case, from Fig. 7, form factor = 0.635.

From equation (6):

$$R_R = 98.75 \times (0.5 \times 0.635)^2$$
$$= 10 \text{ ohms.}$$

The radiation of the horizontal component without considering ground loss (this is a hypothetical situation since a horizontal monopole with a horizontal ground plane is impossible):

$$R_R = 98.75 \times (0.866 \times 0.635)^2$$
$$= 30 \text{ ohms.}$$

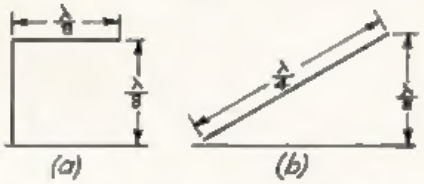

Fig. 18.—The "inverted L" and the "sloping antenna" referred to in the text.

The actual reduction in resistance of the horizontal component by the presence of the ground plane would be great. Unfortunately its effect cannot be simply determined by applying the graphs since the antenna is sloping and since the highest current portion is closest to the ground, the actual radiation resistance will be very small. If as suggested, the reduction of radiation resistance is mainly loss above a lossy ground, the efficiency of such an antenna would be very poor. Only considering the vertical component, the efficiency of a lossless antenna above a perfectly conducting ground is as follows:

Estimated radiation resistance for the horizontal component in the presence of a perfectly conducting ground, assuming the average effective height of the antenna to be one-third of the end height:

$$\text{From Fig. 15, } R_R = 0.052 \times 30$$
$$= 1.6 \text{ ohms.}$$

Useful vertical radiation resistance was 10 ohms.

$$\text{Vertical efficiency} = R_R \div \text{total resistance.}$$
$$= 10 \div 11.6$$
$$= 0.86 \ (86\%).$$

If the ground was completely lossy, then:

$$\text{Vertical efficiency} = 10 \div 40$$
$$= 0.25 \ (25\%)$$

These results do not include losses due to series resistance.

In both cases the proportion of horizontally polarised radiation to vertically polarised radiation would be:

$$1.6 \div 10$$
$$= 0.16$$

It would appear that a sloping antenna is not very efficient.

CONCLUSION

Considering these antennas for receiving they would give some horizontally polarised pick-up as well as vertically polarised. This would have the effect of making audible signals which contain little vertical polarisation, however they would not have the advantage of a completely balanced horizontal. Used as a vertical, the inverted "L" would be comparable in performance with a "T" of the same dimensions.

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ANGLE MODULATION

LECTURE No. 14C

C. A. CULLINAN, VK3AXU*

● Continuing the series of lectures by C. A. Cullinan, VK3AXU, at Broadcast Station 3CS for students studying for a P.M.G. Radio Operator's Certificate.

PHASE MODULATION

Major Armstrong's original f.m. transmitters used phase modulation in order to obtain frequency modulation.

Phase modulation is still used in some high-quality f.m. transmitters and is used extensively in mobile transmitters.

In order to understand phase modulation it is necessary to understand the meaning of the word phase.

In electrical engineering the word phase is usually taken to mean the difference in angles between the current and voltage in an a.c. circuit. If the current and voltage each reaches the maximum and minimum in each cycle the current and voltage are exactly in phase, but if the current lags or leads the voltage then there is a phase difference.

However, the word phase may also mean the time difference between two or more currents in the same a.c. circuit. For instance in a three-phase alternator three lots of current are produced with each revolution of the alternator rotor and these currents are spaced 120° apart in time and they remain spaced this amount irrespective of the speed of the alternator rotor. Fig. 2c illustrates this.

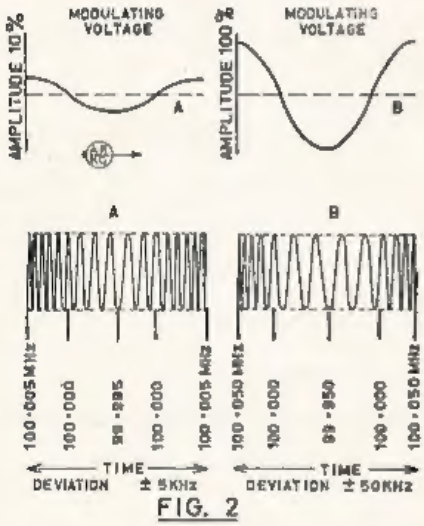


FIG. 2

It has been stated earlier that a change in phase is also a change in frequency and to illustrate this let us visit a power station and watch the operator bring an alternator from rest and connect it to an a.c. power grid.

It does not matter what is the nature of the primary source of power, i.e. steam from a wood burning boiler, coal, oil, atomic energy or falling water.

As the alternator is at rest it is disconnected from the a.c. mains. Before it can be connected to the mains its rotor must be rotating at the correct speed for the particular mains frequency and if it is to deliver power then the current it will produce must be in exact phase with that in the a.c. mains.

Alternators used in power generation are of the synchronous type.

Amongst other things this means that they will not commence rotation (as a motor) if they are connected to the a.c. mains.

However, if they are rotating at sufficient speed to be very close to the mains frequency they will "pull-in" to the correct speed if the incoming mains are applied.

It must be remembered that one of the factors governing the frequency at which an alternator works is the speed of rotation of the rotor.

One of the problems in the generation of a.c. power and its distribution is that the power factor of the total load is most likely to be inductive and for this reason it is common practice, particularly in direct turbine driven plants, to operate one or more synchronous alternators as a motor, letting the turbine impellor rotate in air. The alternator then appears to be a capacitive reactance, so tends to correct the power factor. Such an alternator is known as a "synchronous condenser".

As said earlier, in order to produce power satisfactorily, the alternator must be running at the correct frequency and phase.

In the power station the operator will bring the alternator slowly up to speed, with a small amount of excitation so that a little power is produced. This may be only a few watts, and is used to operate indicating instruments.

By watching a frequency meter, the operator can bring the alternator up to the correct speed (frequency) to match the frequency of the a.c. mains within the tolerance of the frequency meter.

Now, even if the frequencies of the alternator and the a.c. mains are exactly the same (50 cycles per second in most of Australia) there is no guarantee that the phases are identical. In point of fact the phase of current being produced by the alternator may be 180° out of phase compared to that of the a.c. mains. Now, if in this condition, an attempt was made to switch the alternator to the a.c. mains it would appear as a short-circuit across the mains and considerable damage could ensue. (This has actually happened.)

Obviously then, the operator has to synchronise the **phase** of the alternator current to that of the a.c. mains current and we can deduce from a.c. theory that when this has been done the alternator also will be exactly in frequency.

There are several methods which may be used to achieve synchronism. Three of these are the use of three lamps connected in a special circuit, a meter device known as a synchroscope, and a cathode-ray oscilloscope.

Let us assume that the operator is using a synchroscope. This is a meter device in which the pointer can revolve continuously in either direction or stop still. It is fed with a small amount of power, both from the incoming a.c. mains and from the alternator, and compares the phase of the alternator current to the phase of a.c. mains current and when the pointer points to 0°, if the circular dial is calibrated 0-360°, then there is no phase difference between the alternator and the a.c. mains.

Let us assume that the synchroscope shows a phase difference, say 180°, as this is about the worst condition. The operator will slowly alter the speed of the alternator, usually to speed it up, so that the alternator phase will slowly increase and as soon as the synchroscope reads 0° phase difference, the operator will close the mains switches to connect the alternator to the mains. If at the time this is done the phase difference is a few degrees the alternator, being synchronous, will pull into phase and frequency. The operator then increases the alternator excitation anl primary drive so that the alternator produces power to feed **into** the a.c. mains.

Now, from our viewpoint, the most important part of all this is that whilst the operator was altering the phase of the alternator he was changing the frequency as well because the only way he could change phase was to alter the speed of the alternator, and alteration of speed means an alteration of frequency.

However, as soon as synchronism was obtained the phase ceased altering, as did the frequency and the alternator frequency would remain constant.

This description has been made to show that during the time that the phase was changing in the alternator the frequency also was changing and that as soon as the phase stopped changing the frequency stabilised at the a.c. mains frequency.

This is the basis of phase modulation.

The amount of frequency modulation which can be produced by phase modulation depends on the amount of phase shift and the **rate of change of phase.**

Any shift in the phase of an r.f. carrier will cause the effective frequency of the carrier to change **whilst the phase is changing**. Moreover, as soon as the phase stops changing, the carrier frequency will return to its original frequency.

In the earlier discussion on frequency modulation it was stated that the frequency deviation was determined by the amplitude of the modulating audio frequency voltage and the rate of deviation is governed by the frequency of the modulating voltage.

* 6 Adrian Street, Colac, Vic., 3250.

In phase modulation the faster the phase is changed, then the greater is the frequency shift. When the phase is changed at an audio frequency rate, then the change is greater at the high frequencies than at the low frequencies, i.e. a frequency of 10,000 cycles in one second has varied 100 times as fast as a frequency of 100 cycles.

For a given amount of phase shift, the amount of frequency modulation increases directly in proportion to the modulating frequency. This rate of affairs would not enable satisfactory f.m. to be received from phase modulation, therefore the audio frequency modulating voltage is pre-distorted (from a frequency viewpoint) by the insertion of a simple resistance-capacity filter in the audio frequency input to the phase modulator. This filter makes the frequency modulation independent of the audio frequency and proportional only to the amplitude of the modulating voltage. The filter causes the amount of phase modulation to decrease, linearly, as the modulating voltage frequency rises, thus giving a true frequency modulated signal.

Probably the greatest advantage that phase modulation has over direct methods of producing frequency modulation is that it is possible to use a quartz crystal as the frequency determining element, thus having the inherent stability of the quartz crystal in holding constant the carrier centre frequency.

However, there is a penalty to be paid in that the amount of f.m. that can be produced by phase modulation is very small and considerable multiplication must be used to obtain the necessary deviation at the carrier frequency, whereas it is possible, in 1970, to produce direct carrier f.m.

As mentioned previously, the first practical wide-band f.m. transmitters were developed by Major Armstrong and it may be relevant here to give a brief description of one of these transmitters.

A very stable quartz crystal, oscillating at about 200 KHz., was used to generate the fundamental radio frequency. The output of this oscillator, at a low power output, was fed simultaneously to a linear amplifier then to a balanced modulator. The output from the balanced modulator was a double sideband suppressed carrier signal at the quartz crystal frequency. By re-combining the carrier and sidebands in the proper phase, a small phase shift was produced.

In order to prevent excessive distortion, the audio frequency modulating voltage was pre-distorted as described earlier and the effective phase shift was kept to not more than $\pm 30^\circ = \pm 0.524$ radian; the maximum frequency change was only ±24.4 Hz. at the frequency of approx. 200 KHz.

In order to produce a frequency swing of ±75 KHz. at the final carrier frequency of 43.2 MHz., a multiplication of 3,072 times (in round figures, 75 KHz. ÷ 24.4) was needed.

However, the small amount of deviation, at the quartz crystal frequency, would not permit full modulation of the lower audio frequencies, so it became necessary to use a new centre frequency of 10.8 KHz. (43.2 MHz. ÷ 3072) in round figures.

To do this the original 200 KHz. phase modulated signal was multiplied 64 times to give a frequency of 12.8 MHz. ±1562 Hz. (200 KHz. × 64) ± (24.4 Hz. × 64).

This was then heterodyned in a mixer, against another quartz crystal on 11.9 MHz.

Remember that a multiplier will multiply not only the radio frequency but the deviation as well, but heterodyning changes only the radio frequency.

The frequency difference of 900 KHz. was selected, 12.8 — 11.9 MHz. = 900 KHz.

Thus the output of the frequency mixer was 900 KHz. ± 1562 Hz. This was then multiplied 48 times to give a final carrier frequency of 43.2 MHz. ±75 KHz. (to nearest significant figure).

Also note that direct multiplication of the 200 KHz. quartz crystal frequency by 3072 times would not produce the correct output frequency, but by multiplying 64 times, heterodyning and then multiplying by 48 (total multiplication 3072) both the correct output frequency 43.2 MHz. and deviation of ±75 KHz. were obtained. This is a good exercise in frequency multiplication and heterodyning.

This method of obtaining phase modulation can be described briefly in this manner. Phase modulation may be derived by amplitude modulating a constant frequency carrier-wave, removing the a.m. sidebands thus produced from the carrier, shifting the phase of either the carrier or the sidebands by 90° and re-combining the sidebands with the carrier so that a 90° phase shift has occurred.

Phase Shift Exciter

Here are details of a practical phase shift exciter designed along the above lines.

Let a quartz crystal oscillator use a 6C4 valve with a shunt-fed balanced tank. This tank is to excite two 6BE6 valves in push-pull. The centre tap of the tank will go to earth through a grid bias resistor. The plates of the two 6BE6 valves are to be connected in parallel.

Because the grids are in push-pull and the plates are in parallel, there will be no r.f. output at the plates if the input r.f. signal is exactly 180° out of phase between the two grids, and the valves are perfectly balanced.

As this condition is almost impossible to attain, there will be a slight amount of r.f. signal get through.

The No. 3 grids of the 6BE6s should be fed with an audio frequency signal, which is in push-pull (through a resistance-capacity filter as described earlier).

The output of the pair of 6BE6 valves will now be a double-sideband suppressed carrier signal.

The next step is to connect a resistor and small condenser in series across the oscillator tank circuit. The reactance of the condenser must equal the value of the resistance so that at their junction there will be a phase shift of 90° between this point and earth.

Following the pair of 6BE6s should be a class C r.f. amplifier used for isolation. This can be a 6AU6 valve. Its grid is fed from the junction of the phase shift network whilst its plate (tank circuit) is connected to the paralleled plates of the 6BE6s.

In this manner the carrier is re-inserted into the sidebands 90° out of phase with its original phase, and the signal in the tank circuit of the 6AU6 valve has become a frequency modulated signal.

The two 6BE6 valves are part of a circuit known as a balanced modulator.

A reactance-valve modulator may be used to phase modulate a constant carrier by connecting it across a tuned circuit. The variation in reactance of the reactance valve-modulator will produce a phase shift and a small change in phase shift across a tuned circuit also makes a frequency change, hence frequency modulation occurs.

A reactance valve modulator may be placed across a quartz crystal oscillator to produce phase modulation. However, there will be some amplitude modulation as well and this may be removed by passing the resulting signal through one or more limiters (these are valves which pass f.m. but reject a.m.).

SERRASOID MODULATION

During World War II. Major Armstrong developed another method of producing phase modulation through the generation of a saw-tooth wave form. This method was named Serrasoid from the Latin "serra" for saw.

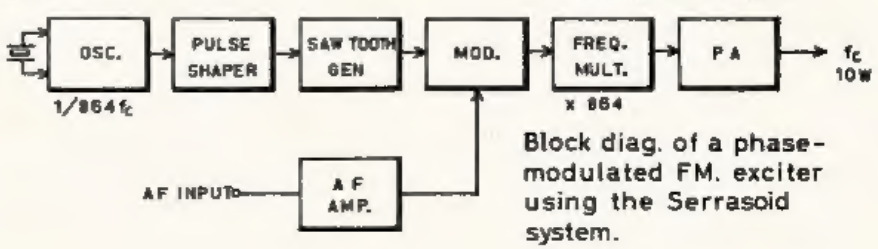
This is a very complicated system but has the great advantage that much less frequency multiplication is required than in other forms of phase modulation for a given frequency deviation.

The basic oscillator is quartz crystal controlled and operates at 1/864th of the final carrier frequency.

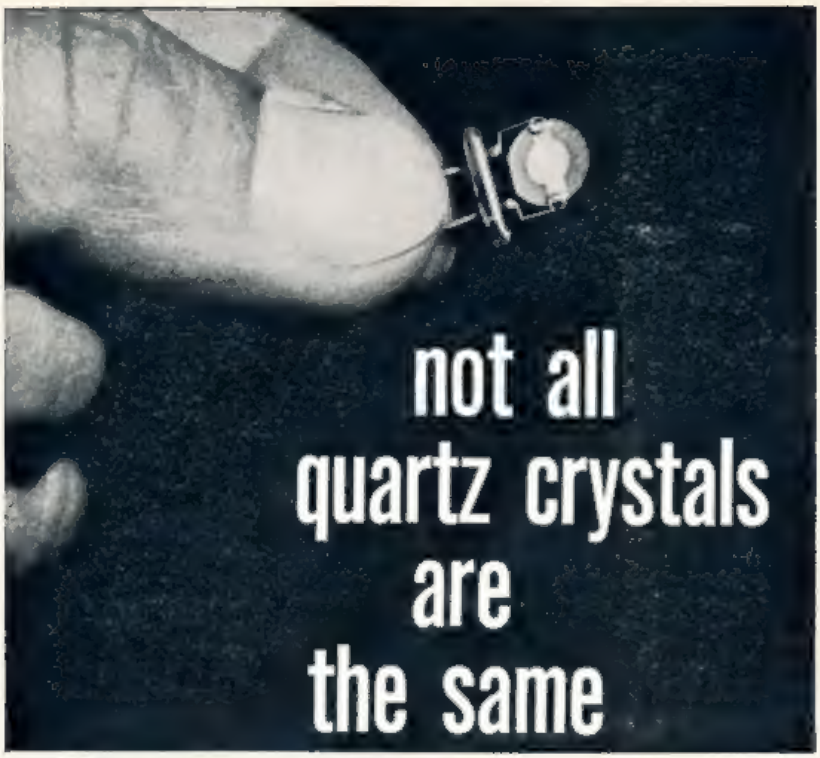
The oscillator drives a buffer stage, for isolation to give a constant load on the oscillator. This isolator feeds a pulse shaper which triggers a saw-tooth oscillator. The saw-tooth wave goes into a modulator, which is essentially an electronic switch and this produces a square wave at its output.

Application of an audio frequency voltage causes the leading edge of the square wave to be slightly advanced or retarded in phase.

(Continued on Page 6)



Block diag. of a phase-modulated FM. exciter using the Serrasoid system.



Today's sophisticated communications equipment calls for crystals that meet the most exacting standards of the art.

Standards that were acceptable a few years ago cannot meet the requirements of design engineers today. Today's tight tolerances demand quartz blanks with precision selected angles of cut, and Hy-Q use X-ray diffraction equipment to determine this most important factor.

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HQ02

ANGLE MODULATION

(Continued from Page 5)

This small change in phase is also a small change in frequency. A number of frequency multipliers steps up this small change in frequency to the desired deviation as well as bringing up the original crystal oscillator frequency to the desired carrier frequency. The usual "pre-distorter" filter is used to obtain frequency modulation.

ANGLE MODULATION

In this lecture on angle modulation we will compare now the two general systems of generating angle modulation.

Phase Modulation

Advantage is that the transmitter can be crystal controlled, thus the centre frequency can be very stable.

Disadvantages: very little deviation is produced so that a large amount of frequency multiplication is required.

Direct Frequency Modulation

Advantages: It is possible to frequency modulate the carrier at the output frequency (up to 108 MHz. at least), hence the large number of multiplier stages are not required. However, rather elaborate means must be employed to keep the carrier centre on frequency.

As mentioned earlier, the majority of American manufacturers (1970) of f.m. broadcast stations use some form of direct f.m.

However, the majority of manufacturers of communications f.m. systems prefer phase modulation because with the small deviation which is permitted, the system is simpler than with direct f.m.

Finally, mention should be made that because of the difference in noise in angle modulation and amplitude modulation it is possible to add pre-emphasis to the high audio frequencies in transmission and equivalent de-emphasis in the receivers and obtain about 10 dB. of noise reduction at 10 KHz. This is not practicable in amplitude modulated systems.

REFERENCES

This lecture has been concerned with angle modulation as a transmission medium and the following references are recommended for further study:

1. The F.M. System (R. F. Dannecker), "Amateur Radio," Dec. 1969. An excellent theoretical article.
2. A.R.R.L. Handbook, section on F.M. is very good.
3. Frequency Modulation (A. W. Keen), Pitmans. An exceptionally good text book.
4. Radiotron Designer's Handbook.
5. N.A.B. Handbook (price is about $40). American F.C.C. regulations and descriptions of F.M. transmitters are included in this huge book.
6. Sound and Television Broadcasting (Sturley), Iliffe, B.B.C. training manual. Section on F.M. is very good.

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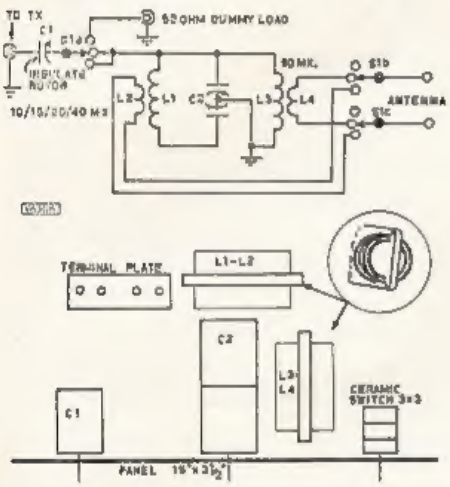
THE "Z" MATCH

RON HENDERSON, VK3ARV*

A centre fed antenna, being balanced to ground, obviously requires a balanced feed-line, which is not the case when co-ax is used and hence high s.w.r. often results to the detriment of output valves. Imbalances and high s.w.r's often result in severe interference to nearby receivers. Using a tuner, however, reduces this and helps to peak the antenna for the band in use. The Z match is the only tuner found at this QTH of reducing the s.w.r. to acceptable levels on all bands.

Construction is simple. Use a three-position **ceramic** switch (from a 609 tx, etc.) for: (a) Z match, or (b) dummy load, 52 ohms. The dummy load consists of 3-watt carbon resistors of 18 ohms and 15 ohms in series/parallel (two legs of 104 ohm) immersed in a gallon tin of transformer oil.

The ability to switch from 80 metres to higher bands without changing antenna terminals is very handy; 10 to 40 metre band tuning is done on one position of one coil, and 80 metres on the larger coil.



Tuning capacitor gangs were from an 1154 tx. In the diagram, C1 comprises two gangs, approximately 180 pF., connected in parallel. The whole unit is one piece of the old tx panel with added-on sides. Coils are mounted on the back of the gangs and at right angles to one another.

Coils are as described in the R.S.G.B. Handbook, Section 13 (Z Match article). Home-made coils were first wound on cardboard forms, then removed and with a screwing action the wire is fed through holes in perspex [polystyrene is better—Ed.] sheets (two pieces 4" x 3½") and cemented on each hole. Coils are 14 s.w.g. wire. L1 consists of 5 turns, 2½" diameter; L2 is 5 turns, 3" diameter equally spaced over L1. L3 is 8 turns and L4 is 6 turns spaced centrally over L3—same diameters as for L1/L2.

Capacitor C1 can be a single of 350 pF. and C2 is 250 pF. dual stator; good insulation, preferably ceramic. Short leads result when the coils are mounted on the capacitors. PL259 connectors were used—4½" spacing for 600 ohm feeders.

The antenna in use is a standard size 3.5 MHz. dipole (468/F MHz., or 133 ft. 7 in. long), fed with 90 feet of 600 ohm open-wire feeders (14 s.w.g. wire, spaced 4½"), high in the air and clear of obstructions.

See you on the DX bands, especially 20 metres.

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OBSERVATION POST

By H. F. EVERTICK

Communications — the key to our hobby.

It was amazing to read the other day the high percentage of school children who cannot communicate in English. Right here in Australia. Would you believe it—children! Older migrants set in their ways, yes. But school kids!

What would Amateur Radio communications be like without English as a common language? Luckily, we have taken over so much formalised material —the Q code, N.A.T.O. phonetics, c.w. abbreviations. To this we have added bits of own own, "My receiver is double conversion, transmitter is 100 watts, aerial is dipole 15 metres high, wx is cold and rainy, please QSL." Do we understand this may be the limit of the English spoken? Or do we think they sign off for fear of entering fields of discussion, perhaps verboten? In fact the first is nearer the truth. Evidence elsewhere points to language being the barrier to further conversation.

How many of us could converse in their language? Even to the minimum extent to qualify for a QSO? How many of us could understand call signs in Spanish, French or anything except English?

A few of us, even from the older brigade, are busy learning a foreign language—Italian, Japanese, Portuguese maybe. Others of us can converse in English and a "mother tongue"; Dutch, German, French, Polish even. But would you believe it, there is even an Amateur Radio interpreter book. Pick your language, listen on the bands and practice your pronunciation. Do it yourself in fact.

Some other areas come to mind where interests can be channelled. There are some migrants on the periphery of Amateur Radio in Australia who cannot pass the exam. because their English is inadequate. Can we rally round to make them at least feel at home in Amateur Radio here? Are they in sufficient numbers to warrant short technical English classes by groups or individuals? Would the multi-choice answer type of exam. solve these problems? What price reciprocal licensing? Then there are overseas students here. Kindly Amateur Radio acts could recruit potential Amateurs or ambassadors in countries where the hobby is not flourishing. Perhaps our efforts now could affect the voting in a future Space Conference because someone highly placed knows what Amateur Radio is and does.

Do we exercise patience and tact when we hear Amateurs struggling on the DX bands to express themselves in unfamiliar English? Maybe these are from near neighbours of ours for whom we discuss "Aid" in other fields. Here is one area of aid.

Further elaboration seems pointless in this language affair. What a wonderful way to meet others half way.

Auf wiedersein, au revoir, tot siens, kwa heri, 73.

SIDEBAND ELECTRONICS ENGINEERING

Sorry to have to announce that my attempts to also import KW ELECTRONICS Transceivers at attractive prices have failed. Unnecessary delays occurred in U.K. in loading a consignment on a freighter that could have arrived in Sydney in time before the deadline imposed on me.

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SPACE CONFERENCE REPORT

Notes on a talk given by Mr. Tom Clarkson, ZL2AZ, on his attendance at the W.A.R.C. (Space Conference) of the I.T.U. in Geneva in June/July, 1971, as the representative of I.A.R.U. Region 3 Association.

Tom Clarkson said he had been part of the I.A.R.U team in Geneva headed by I.A.R.U. President Bob Denniston, W0DX. This team included John Huntoon, W1RW; Dick Baldwin, W1RU; Noel Eaton, VE3CJ; and Win Dalmijn, PA0DD. In addition, Dr. Perry Klein, K3JTE, of AMSAT had attended for part of the time. Many other Amateurs were discovered in the Delegations, including Roy Stevens, G2BVN (Secretary, I.A.R.U. Region 1), who was known beforehand to be part of the U.K. Delegation. Tom had found his status as an Amateur and a volunteer extremely useful.

At the Conference were 91 official country Delegations, 2 private organisations, 5 United Nations agencies, and 17 international organisations including I.A.R.U. A total of about 700 participants. The I.A.R.U. team was, of course, present in the observer role in common with most of the other organisations. The work of the Conference was channelled through various committees. Many of these committees were further split up into working groups In some instances there were 90/100 participants in the working groups.

Of particular interest to Amateurs was Working Group 5C. This was part of the Allocation 5 Committee Group 5C dealt with Meteorological, Earth Resources, Time Signals and the Amateur Service. There were points of interest for Amateurs in other committees as, for example, the Technical and Regulations Committee, and attention therefore had to be paid to the work going on elsewhere.

At the outset it became clear that an influential European policy of some rigidity had been formulated in advance and the Delegates concerned were well briefed. At the core of this was the fear of possible interference with other services and frequency requirements for such items as television, broadcasting, other satellites, radio astronomy and so on. The existing alliance on a shared basis between the Amateur Service and radio location proved sound despite later failures. A prepared Amateur Service's paper was read out at an early stage of the Plenary and at all times good mileage was made out of the origins of Oscar 5.

In the Regulations Committee new definitions came into being. These included the "Amateur Satellite Service" as "a service using satellites to carry on a service with the same definition as the Amateur Service". The latter is an existing definition. Some doubts exist about the technical requirements affecting the Amateur Satellite Service which can only be resolved when the final documents of the Conference come to hand. These questions raised problems of considerable complexity although the launching country appears to be the responsible authority for the life of the satellite. It appears that the general provisions affecting the use of satellites will also apply to Amateur Satellites.

The report of Working Group 5C merely recorded that the principle of the Amateur Service to possess satellite operating rights in the shared bands could not be agreed. Surprise and dismay were expressed at the intensity of the opposition. The use of the exclusive Amateur bands for the Amateur Satellite Service was accepted though not without some discussion. It was towards the end of the sessions of this Working Group that a proposal came up that 435 to 438 MHz. might be set aside for Amateur Satellite Services on a world-wide basis. This proposal was made some time after the Chairman had permitted I.A.R.U. to present a statement justifying the demonstrated practicability and previous experience of command procedures in Amateur Satellites.

The stage was set therefore for further discussions on the subject in the main committee As events turned out, the voting of the Working Group was merely recorded. Almost no discussion was permitted. The situation therefore appeared hopeless because the Plenary merely rubber-stamps Committee Reports.

On the very last day (15th July) of the Conference the Agenda listed papers for discussion which had been ruled out at the committee stages. In this atmosphere considerable support came out for the 435-438 MHz. counter proposals previously ignored. In the voting, 83 were in favour and only 3 were against. This is the story of a small victory against massive odds.

Observers on behalf of the International Amateur Radio Union, at the World Administrative Radio Conference for Space Communications held by the International Telecommunication Union at Geneva, Switzerland. June-July, 1971.

Left to right. Roy F Stevens, G2BVN, Secretary I.A.R.U Region 1 Division, John Huntoon, W1RW, Secretary I.A.R.U.; Thomas R. Clarkson, ZL2AZ, Director I A.R.U Region 3 Association, Robert W Dennision, W0DX, President I A.R.U., Wijnand J L. Dalmijn, PA0DD, Honorary Treasurer I.A.R.U Region 1 Division, Noel B. Eaton, VE3CJ, Treasurer and Member Executive Committee I A R.U Region 2 Division, Richard L Baldwin. W1RU, Assistant Secretary, I.A.R.U. This group was joined for the latter part of the Conference by Perry I. Klein, K3JTE, as Adviser, not present in this photograph.

The photograph was taken in front of the I.A.R.U stand at the Telecom 71 International Exhibition held in Geneva at the time of the Space Radio Conference.

In relation to the higher frequencies, although we did lose the 21 GHz. band we gained an exclusive segment from 24 to 24.05 GHz. inclusive of the Amateur Satellite Service and 24.05 to 24.25 GHz. shared with Radiolocation The Conference dealt with the frequencies up to 275 GHz.

Drawing conclusions about the Conference illustrated a minor success at the eleventh hour which demonstrated that the Amateur Service could not be so easily disposed of. The presence of the I.A.R.U. team was vital despite the loss of satellite rights on the other shared bands. A useful number of the Government Delegates previously in opposition now have been compelled to re-orientate their ideas. The absence of results achieved by certain other services with only one or two observers was particularly noticeable.

It is understood that the effective date of the final conclusions of the Conference will be 1/1/73. At an early stage some discussions took place on the administrative use for experimentation of frequencies for satellites under Regulation by sympathetically inclined authorities, as for example Reg. 115 in relation to 10 metres for AO5. The need to follow up this matter did not arise.

Many authorities appeared to believe that the next International Conference would be held about three or four years' time. This is admitted as being overdue at the present time.

The results of this Conference provide considerable material for consideration in connection with trends in the Amateur Service during recent years. The usefulness of the service in providing training and encouragement is a sine qua non. To make our own apparatus and to communicate are two additional essentials. The latter should obviously encompass communal services such as field days to keep ourselves in readiness for emergencies notwithstanding the existence of other experts in the field. A stage where the Amateur is unable to service his own equipment has been reached elsewhere and this appears unlikely to be in the best interests of the Amateur cause Some re-thinking on the 3rd Party prohibition might be desirable for scattered communities lacking in other communications.

Finally, the Oscar programme seems essential to our cause.

SUMMARY

The Amateur Satellite Service is authorised to operate in the bands:—

7.0-7.1, 14.0-14.25, 21.0-21.45, 28.0-29.7, 144-146, 435-438 MHz. and 24.0-24.05 GHz

Secured 24.05-24.25 GHz. in lieu of 21-22 GHz.

All Amateur bands, except 21 GHz., remain unchanged for terrestrial use

CUSTOMS IMPORT DUTIES

Customs Duties along with Excise Duties form the major part of a group classed as indirect taxation. Income Tax forms the larger part of the direct taxation group. Customs Duties are charges levied on the importation of goods for home consumption. Excise Duties are imposed on certain locally produced goods for domestic consumption. These are broad definitions.

Customs Duties are charged according to rates set out in the Customs Tariff which forms a part of the general legislation pertaining to Customs and Excise. In order that the charges may be levied in a uniform manner at the same rates when goods are imported through any port or by air or parcel post, it is essential that all articles of commerce are adequately and precisely classified.

In the very early days Customs Import Tariffs were based more or less on rule of thumb principles. For example, tobacco goods, alcoholic beverages and certain other kinds of goods were listed and rates could be applied uniformly. All other imports would then come under a "rag bag" or "blanket" item.

As international trade continued to develop the national tariffs became more and more complicated. This began to create anomalies since it is an axiom that the greater the number of words used in a legal definition the greater will be the possibilities of differing interpretations.

Various efforts began to be made to introduce classification lists divorced from those produced solely for purposes of rates of customs duties applications. Several other factors also began to emerge more strongly, such as statistics, trade agreements, protection to local industries or production and so on.

A classification listing of goods on an international level called the S.I.T.C. was devised mainly for statistical purposes and was taken over by many countries for their Customs Tariffs. This classification was (and is) based on the principle of sections beginning with the simple raw materials and working through to the more complex manufactures more or less on the basic ingredient or material.

However, for a number of reasons this kind of listing was found to fall short of Customs requirements and another kind of classification was devised in Europe under the auspices of the Customs Co-operation Council in Brussels. This, produced in the early 1950s (was known as the B.T.N. or Brussels Tariff Nomenclature, and came out in the English and French languages. This B.T.N. began to be adopted by more and more countries until today over 100 countries use it, including Australia, although the statistical codings still conform to S.I.T.C which has now been keyed to it. The latter is a United Nations "enforcement" for the compatibility of World Trade Movements.

You will ask why so much time is devoted to the classification history. The answer is comparatively simple. It enables local officers of Customs to classify goods with reasonably uniform precision without simultaneously having to consider (in general) if a different classification might result in a higher or lower duty charge. In other words, the applications of various duty ratings become more and more a matter for centralised policy decisions. It also enables, or should enable, the importer to calculate in advance the rate and amount of duty he will have to pay on his imports and he should know that his competitors will have or should have the same applied in their case also.

The present over-all Australian Customs Tariffs procedures do not, however, completely achieve these results despite an enormously complex system. The reason stems not only from the Tariff itself, but from the By-Law provisions which have grown up as a by-product of protectionism.

You see, it works this way—in much simplified terms. It may be submitted to the government by a manufacturer or group that the radio and electronics industry cannot flourish against imports of cheap radios or t.v. receivers. The government agency concerned — normally the Tariff Board—examines the facts revealed from an investigation made by them. It may then decide that certain rates of import duty are desirable in order to give the local manufacturer a fair chance to compete on the local market. These rates of duty, if approved by parliament, then are applied and become protective duties and may be slightly higher or very considerably higher than the rates of duty which would normally have applied solely for revenue producing purposes.

Unfortunately, further complications begin to manifest themselves. This applies not only to protective duties which are imposed to protect an existing industry, but also to duties which might be imposed to encourage the establishment of a new industry or to allow an existing industry to expand into other manufacturing fields. The protective umbrella may, therefore, be a small one or a very large one.

ELECTRONICS INDUSTRY

Let us have a closer look at the size of this Australian umbrella for the electronics industry by going back to classification again.

In the B.T.N. Tariff, radiotelephonic and radiotelegraphic transmission and reception apparatus are classified under heading (or item) No. 85.15. In all the B.T.N. Tariffs the various headings are sub-divided in accordance with each country's individual requirements. Thus, one country might want to separate out broadcast receivers for one rate of duty and all the other goods of that heading for another rate; thus you would see "85.15.01 (or 85.15A) radio broadcast receivers 50%, 85.15.99

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(or 85.15B) other 20%". In another country they might require more subdivisions such as "b.c. rx, t.v. rx, other" which, because of subsequent legitimate attempts by importers to circumvent high rates of duty, might later become "b.c. rx, chassis complete or incomplete, t.v. rx, t.v. rx assemblies with tube, valved receivers, portable receivers and other". So the complexity increases and fragmentation grows. But there is a practical limit to the fragmentation which can be incorporated into a Customs Tariff. Even now, the Australian Customs Tariff is a massive document over 2,000 pages.

Yet a further complication arises. It might be decided to protect b.c. receivers with a high rate of duty and this high rate would be carried through to components because otherwise somebody would by-pass the protection by importing complete receivers in knocked-down parts for local assembly (Meccano fashion) to undercut high duties on complete radios. Components for b.c. rx classified in other headings (or items) of Chapter 85 in the B.T.N. (e.g., valves and transistors fall under 85.21). So all the rates in all these headings (items) must be aligned

But when this is done, the very industry requiring protection would have to pay duty on the components which it must import because they are not manufactured locally. It would be quite impossible to fragment every appropriate Tariff Item into "Parts for XYZ Co. Ltd.—Free" and "other 50%" in order to rectify this position since, over a period of time the list of companies would grow like Topsy, apart from other reasons why this kind of fragmentation is unsuitable (e.g., XYZ Co. Ltd. selling free of duty parts to the public). Hence some other device must be resorted to if the situation is to be rectified.

Some countries restrict the size of the umbrella to bare essentials, others allow "parts for industry" at lower duty rates; yet others use Ministerial discretion to overcome these problems. Australia uses the last mentioned procedure which is set out legally in the following two main forms:

"19. Goods, as prescribed by by-law, being goods a suitable equivalent of which that is the produce or manufacture of Australia is not reasonably available. 7½% Free."

"20. Goods, as prescribed by by-law, being goods a suitable equivalent of which that is the produce or manufacture of Australia, or the produce or manufacture of the United Kingdom, is not reasonably available. Free. Free."

(Under the Treatment Code these are listed as "707" and "700" respectively with the numbers 717 and 710 for ad hoc by-laws)

This is a practical way out of the difficulty. Furthermore, it permits discretion to be exercised for low rates of duty in respect of main apparatus (e.g. certain kinds of b.c. tx) which cannot be or are not produced locally. In addition, such discretion could be exercised in favour of specific organisations or classes of organisations (e.g. ship marines), companies, or products.

So we have the By-Law provisions and the supplementary By-Laws. These green paper publications are well over 3" thick and the regular re-printed pages of revisions can run into thick wads of paper. These are published and are available for anyone to peruse in the right places. The provisions of these By-Laws and Supplementary By-Laws apply to all ports of importation. Some of the provisions include a security clause whereby end usage is restricted under official control.

But these two sets of published By-Laws are by no means the end. An additional series of Ministerial ad hoc decisions are exercised in favour of specific importers for imports through a specified port in respect of specified goods (sometimes restricted over a period of time). These are not published and are, therefore, known only to the Customs, the importer and the importer's customs agent. It is a customs maxim that the affairs of one importer are not revealed to any other importer

And, as importers who enjoy concessionary import rates of duty do not ordinarily discuss their "advantages" with other people, it is not known who can get what at any particular time. No criticism is levelled at officials, but the system itself appears to merit closer examination. It is this system which has caused so much confusion in Amateur Radio circles.

EXAMPLES OF DUTY

Turning now to the size of the umbrella used for protection under Tariff Item 85.15 (and associated spare parts and components items), the present sub-divisions extend to six subheadings which, briefly, are:

85.15.100—		
Radio b.c. receivers	45% + $10 ea.	27½% + $10 ea.
85.15.200—		
T.v. receivers	45% + $50 ea. + 12½% on pict. tubes	27½% + $50 ea.
85.15.300—		
T.v. chan. tuners	45%	30%
85.15.400—		
T.v. camera pick-up heads	Free	Free
85.15.500—		
Parts for goods in 85.15.100/200	45%	27½%
85.15.900—		
Other	45%	27½%

The second of the two columns of duties (the preferential column) refers to the goods of the origin of the United Kingdom, Canada, N.Z. (except Trade Agreement items), T.P.N.G. (This is a generalisation but is correct for 85.15.) The first column refers to goods of any other country of origin. The same applies to the By-Laws previously quoted herein. "Origin" is, of course, closely defined and must conform to a minimum country content if preferential rates of duty are claimed by the importer.

It so happens that our ordinary Amateur Radio transceivers and transmitters are classified under Item 85 15 900. This is a high rate of duty. When coupled with Sales Tax of 15%, the tax man takes a good pound of flesh. But this does not end here. Importers must base their selling prices on landed costs which, of course, include duties and taxes, freights and other on costs

Finally, in a short article of this nature it is possible only to have a look at the wording of the discretion allowed to the Minister. The criterion is that a suitable local equivalent is not reasonably available. The decision rests with the Minister. This is based on the submissions made by an applicant and the comments put up by the official experts. The Minister's discretion has not hitherto been exercised where a local manufacturer states he is in a position to supply the goods concerned from his own production. This is where there is considerable room for manoeuvre by local manufacturers.

Officialdom endeavours to analyse all such claims but there is a limit. It is, therefore, quite obvious that pressures from manufacturers on the one hand (whether or not truly justified in terms of actual production at any given moment in time) are offset against pressures from importers on the other hand. If the manufacturer wins, we pay more for the apparatus concerned. If the importer wins, we pay less.

— . . . —

LICENSED AMATEURS IN VK

APRIL 1971

	Full	Lim.	Total	
VK0	11	1	12	
VK1	84	29	113	
VK2	1404	474	1878	
VK3	1322	656	1978	
VK4	521	197	718	
VK5	522	233	754	
VK6	368	139	507	
VK7	160	66	226	
VK8	27	12	49	
VK9	92	10	102	
	4521	1816	6337	Grand Total

MAY 1971

	Full	Lim.	Total	
VK0	11	1	12	
VK1	84	29	113	
VK2	1418	484	1902	
VK3	1319	661	1980	
VK4	519	202	721	
VK5	519	231	750	
VK6	366	139	505	
VK7	159	66	224	
VK8	33	13	80	
VK9	91	11	102	
	4523	1836	6359	Grand Total

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VK2VC—D Kelly, 3/89 Leyland Pde., Belmore, 2192
VK3AFI—F E. Stayte, 19 Balaclava Rd., Berowra, 2081
VK2AWT W R. Taylor, "Yarrawonga," Mac's Reef Rd., Sutton, 2581.
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PREDICTION CHARTS FOR SEPTEMBER 1971

(Prediction Charts by courtesy of Ionospheric Prediction Service)

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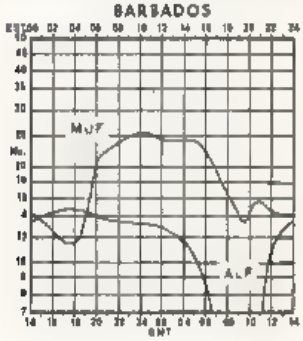

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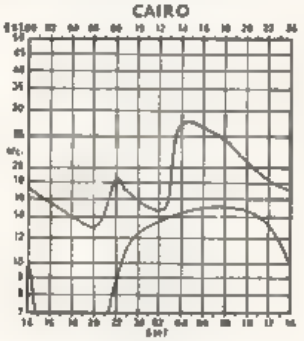
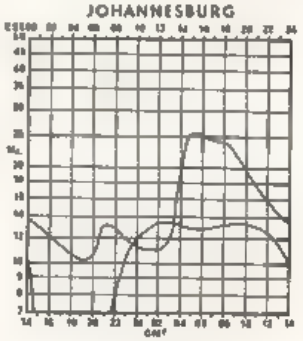


JOHANNESBURG



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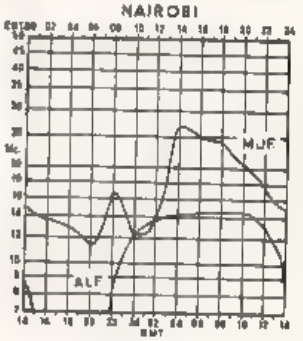

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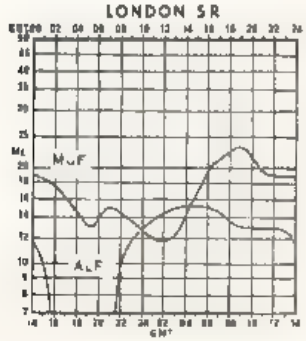
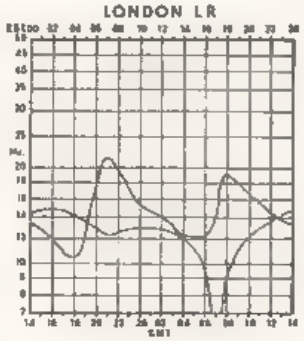


LONDON LR



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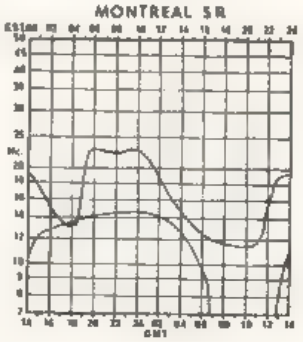

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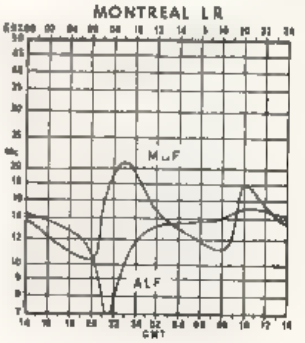
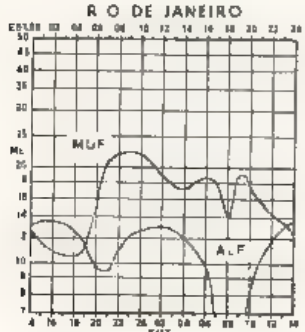
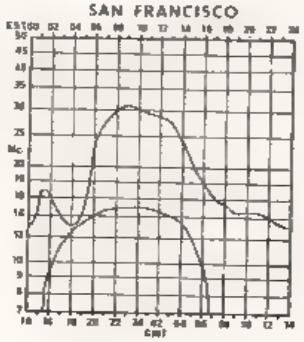


R O DE JANEIRO



SAN FRANCISCO



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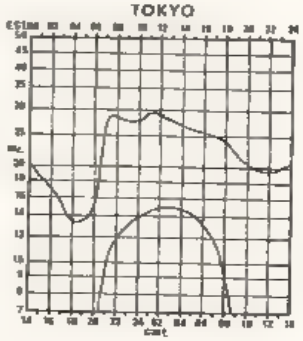
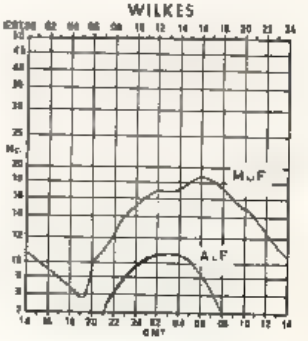


WILKES



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VK6JX—J. A. Large, 51 Lionel St., Kalgoorlie, 6430.
VK6PK/T—P. C. Kloppenburg, Flat 20, Tuckeys Holiday Flats, Carnarvon, 6701.
VK6ZGF—J. A. Hassell, Station: 55 Birdwood Pde., Dalkeith, 6009; Postal, 15/381 Barker Rd., Subiaco, 6008.
VK7BP—B. W. Proudlock, 11 Watkins Ave., West Hobart, 7000.

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VK1ZMR—R. Miles. Now VK1MP.
VK2ZAX—L. A. Maschette. Now VK3ZDN.
VK2ZMR—R. Miles. Now VK2BMG.
VK3IM—Q. N. Porter. Not renewed.
VK3MW—S. G. White. Not renewed.
VK3UV—L. E. Martin. Transferred to N.G.
VK3XI—H. G. Duggan. Not renewed.
VK3ADE—R. D. Edwards. Not renewed.
VK3AES—J. L. Morris. Now VK2BES.
VK3AHP—J. M. Hamilton. Not renewed.
VK3AHY—J. Vogel. Transferred to W.A.
VK3AVH—V. W. Hercus. Not renewed.
VK3AXK—S. R. Coleston. Now VK3KX.
VK3AXL—J. A. Ferguson. Transferred to W.A.
VK3BBJ—J. Gruber. Not renewed.
VK3BDZ—V. W. Harrison. Not renewed.
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VK3YEY—S. D. C. Tovey. Now VK3BFN.
VK3ZBV—J. Quigg. Not renewed.
VK3ZCX—C. R. Emery. Not renewed.
VK3ZGG—R. G. Rowlands. Now VK3AFS.
VK3ZHY—A. R. Webb. Now VK3AHT.
VK3ZKR—M. J. Howden. Not renewed.
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VK4KG—K. G. Avery. Not renewed.
VK4OA—J. P. Baker. Not renewed.
VK4VA—V. F. Burman. Transferred to A.C.T.
VK4XF—J. F. Russell. Transferred to S.A.
VK4ZGJ—G. J. Richardson. Not renewed.
VK4ZPU—P. S. McWhinney. Not renewed.
VK5GJ—L. M. McGrath. Not renewed.
VK5GR—H. E. A. Gehrke. Deceased.
VK5SV—K. E. Pledger. Transferred to W.A.
VK5ZBJ—J. H. Johnston. Not renewed.
VK5ZFY—F. Richelme. Not renewed.
VK5ZIC—I. R. Clayton. Not renewed.
VK6ZJC—J. C. Vayne. Transferred to Vic.
VK5ZJL—C. [redacted] Lill. Not renewed.
VK5ZMC—L. N. Coventry. Not renewed.
VK6CG—R. C. Crowe. Not renewed.
VK6HA—H. A. Wood. Not renewed.
VK6KP—F. W. Paulist. Not renewed.
VK6CID—L. W. Hoobin. Deceased.
VK6ZCB—C. B. Howard. Now VK4ZNZ.
VK6ZGC—B. A. Coghlan. Not renewed.
VK7RF—D. E. Briggs. Not renewed.
VK7TC—Hobart Teachers' College Electronics Club. Not renewed.
VK9AN—A. D. Hunt. Returned to mainland.
VK9JR—J. Rutherford. Not renewed.
VK9KJ—K. L. Finney. Now VK2KJ/T.

OVERSEAS MAGAZINE INDEX

ANTENNAE 2, Fan Dipole for 40, 3, Review, Hy-Gain 400 rotator, 4, Practical Design of Mobile Aerials (h.f., v.h.f., u.h.f.); 5, Another Man's Whip (helical type); 7, Special Antenna issue—Driven vs. Parasitic Elements, Three Element Quad for Two Metres, Weather Balloon Vertical (half-wave vertical presented as having a feed impedance of 50 ohm when fed from one end—more likely to be 5,000), Tuning Mobile Antennae, Practica, 40 mx DX Antenna (the Bruce), 8, The Heli-Rope Antenna, a 42 ft. Crank-up fold-over Tower (hinged at ground level), 9, The Conical Monopole, 10, Housing an a.t.u. (plastic container, Odd Shaped Antennae (square, rectangular, triangular, etc.), 11, Quadruple Quad for Two Metres.

ACCESSORIES: C.w.—1, Another 1C Keyer (Part 2); 3, The Side-Bridge C.w. Monitor, Inexpensive Electronic $7. Keyer. **A.m./S.s.b.**—3, The Garden Patch. **Other**—8, R.t.t.y. first steps in, Motor Speed Control for Hand Tools, 9, Transistorised T.U. for r.t.t.y., 11, S.w.r. and Cable Attenuation.

BEGINNER & NOVICE 8, New Life for the "All-American" Five using an old b.c. rx as part of a short wave receiving system.

RECEIVING 2, Universal Solid State Preselector Converter for S.W. Bands, 3, Analytical Approach to Mixer Spurious Evaluation, Reducing Spurious Responses in V.h.f. Converters, 6, Two Metre FET Converter (re-print from V.h.f. Communications), 8, High Performance Two Metre Converter, 9, Cheap General Coverage Receiver, Part 2 (Mod. R1155), 11, A Modular Receiver System.

TRANSMITTING 7, VFO-ing the Two'er, 9, Versatile Sub-Modulator with Speech Compression using ICs, 10, Discussing the KW-2000B (Review, very thorough), 10, Two Metre Portable Transistor Tx, 11, A 2 Mx Walky-Talky, 11, 28-432 MHz. Converter with FET Mixer.

TEST EQUIPMENT 1, R.f. Bridge, 2, S.w.r. Bridge with Signal Source (all h.f. bands), 4, 20 MHz. Frequency Counter, FET Tester, 7, I Built a Counter (17-yr.-old builds Heath IB-101 Capacity Decades), 11, Stripline Reflectometers for 144 and 432 MHz.

EQUIPMENT MODIFICATIONS: 2, Ham-M Rotator, 7, Mods to Heath H.W. Transceivers.

POWER SUPPLIES 7, Low Cost Transistor Supply.

KEY (all issues 1971

1. "Break-In"—June
2. "CQ"—June
3. "CQ"—August
4. "Radio Communication"—July.
5. "Radio ZS"—June.
6. "Radio ZS"—July
7. "73"—June.
8. "QST"—June.
9. "S.W. Mag."—May.
10. "S.W. Mag."—June.
11. "V.h.f. Communications"—May.

OBITUARY

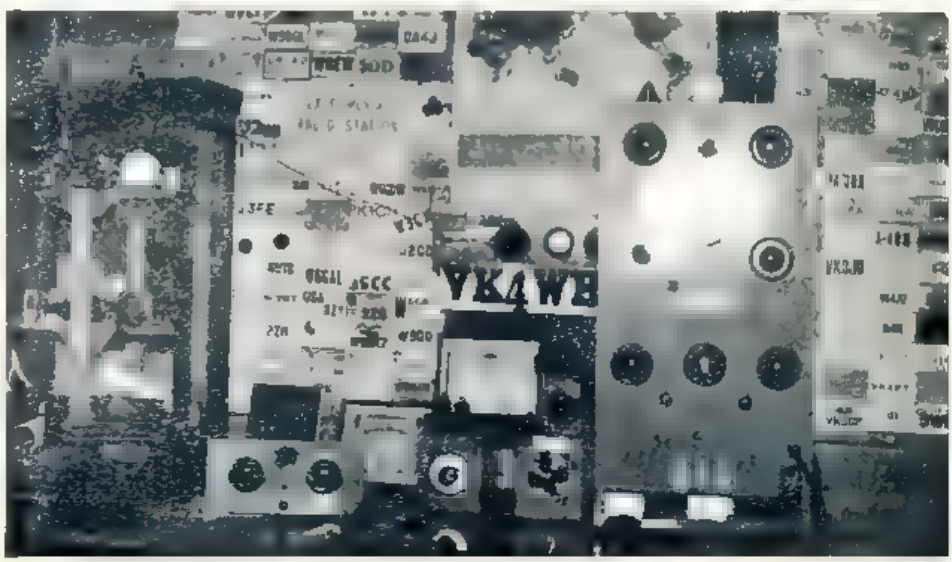
W. E. (EDDIE) HAGARTY, VK4WH

A link with early Amateur Radio in North Queensland severed with the recent death in Townsville of Mr. William Edward (Eddie) Hagarty, VK4WH, who died at the age of 68 years.

He was licensed at an early age in Longreach and experimented extensively with all types of receiving and transmitting equipment. He was credited with a few "firsts" in radio while at Longreach.

He was a keen supporter of the Townsville Amateur Radio Club and held the position of Secretary and Treasurer for many years.

Active throughout his years in Townsville, I am sure many Amateurs in Australia and overseas will remember Eddie Hagarty.



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DIVISIONAL NOTES

NEW SOUTH WALES

This marks the re-introduction of Divisional Notes in "Amateur Radio". Club Secretaries and Publicity Officers are reminded that these notes and material for the Calendar) should reach the sub-editor at the VK2 rooms on or before the general meeting night. Deadline for Nov "A.R." is Sept. 24.

VK2AJE has tendered his resignation from Council, but remains as Hon. Solicitor. His place has been taken by Mike Farrell, VK2ZNA (awaiting his full call). Mike is active on 6 and 2 mx as well as Sec. V.h.f. Group.

At Sept. 24 gen. meeting we hope Mr. C. Allan can give us a lecture on Civil Defence Communication. The Division is collecting equipment suitable for use by Amateurs in Indonesia. While complete equipment is preferred, parts suitable for constructional use would be acceptable. Please leave gear at the rooms; further details available from the Admin. Secretary.

Tender submitted recently for high-band f.m. units was unsuccessful.

Since the robbery at the Divisional Station VK2WI, Dural, in Oct. 1969, the communication needs of the VK2 Division have been conducted from our Atchison St. Station (VK2AWI). While this site has provided fair v.h.f. signals, the h.f. coverage has been deteriorating for many months, usually in ratio to the increasing high rise development in the Atchison St. area. A few months ago an 80 mx transmission was added to the broadcast system to supplement the 40 mx signal.

In the meantime, work has proceeded at Dural to install the new h.f. transmitters, power wiring and control equipment. At first, transmissions will be on our usual frequencies on 40 and 80 mx a.m. and the 6 and 2 mx nets as at present. Once we have operation on our main frequencies, a 160 mx a.m. transmission and s.s.b. facilities for 80, 40 and 20 mx will be added. On v.h.f., beacons will be installed on 6 and 2 mx (intended frequencies 52.2 and 144.2 MHz.). On u.h.f., a 70 and 23 CM. tx will be installed. We hope the new h.f. tx's will provide better coverage to southern VK2 where currently our signals are being overridden by the closer Interstate stations.

The VK2 V.h.f. and T.v. Group is handling the ZL 2 mx Converter (produced by the Christchurch V.h.f. Group) which sells in Australia for $9 postage paid. Based on an R.S.G.B. design, it ends up as a very neat 1¼ x 3½ inch p.c. board. For full details write to the Secretary, V.h.f. Group, via the rooms.

Loan of Equipment: The VK2 Division has a number of 50w. f.m. base stations suitable for simplex operation on 146 MHz. nets. We also have a limited quantity of duplex units suitable for conversion for repeaters. We are prepared to loan these to member clubs on an indefinite loan arrangement. Please note these are available to **VK2 Member Clubs Only** and applications from individuals will not be considered. For further details please write to the Secretary, W.I.C.E.N. Committee, via the rooms.

Morse Instruction. Bill, VK2LH has taken over from Doug VK2AVC, to whom our grateful thanks for past efforts. Operators are always required, so if you can help please contact Bill or VK2 Council. Tapes from Max VK2BMK at small charge plus post, beginners to 20 w.p.m. in 5 inch spools and C90 series cassettes—loan period two months.

St. George Radio Society (V.-Pres., VK2AAC, phone 587-0406 evenings; Sec., VK2BMM, Mike McKenzie, 16 George St., Penshurst, 2222) meets in School of Arts, Short St., Carlton from 1915 hours. (Check St. George "net" Tues. 14100 KHz s.s.b. 2030 hrs.) Formed in May 1971 for everyone interested in Amateur Radio.

Illawarra Branch. Construction of Moonbounce Project tx is virtually complete (testing to dummy load to be done). Final phase of circularly polarised feed system installation should also be completed soon. Dapto site and buildings are being repaired ready for installation and operation of the equipment.

(Supplied by Sub-Editor, Tim Mills, VK2ZTM)

SOUTH AUSTRALIA

Jubilation in the Div. Council room greeted the news of the re-appearance of Div. Notes and I was the unfortunate "volunteer". My first task is to pay homage to my predecessor, Warwick ("Pansy") Parsons, VK5PS, who produced those eminently readable notes for many years. Without a ready network of spies, there may be a little difficulty in meeting printing deadlines for the next few months, so these notes may be confined to general topics pro tem.

To introduce myself, I was first licensed in 1960 with a Z call, followed by the full call in 1962. My main interests are v.h.f., constructing gear and management. I hope it will be possible in future issues to highlight interesting local events and personalities. Please let me have your South Australian news and views not later than a week before the end of the month. Thank you and 73.

(Supplied by Bart VK5GZ.)

(Ed.—Bart's notes continued with items which have been taken out into the Div. Directory and Calendar.)

DIVISIONAL DIRECTORY

NEW SOUTH WALES

Rooms: 14 Atchison St., Crows Nest, N.S.W., 2065. Mon.-Fri. 10-12, 13-15 hrs. (15-21 on 4th Fri.), Admin. Sec., Mrs. Judy Deans, phone 02-43-5795; Gen. Mtgs. 4th Fri. (Dec. 3rd Fri.), Council Fri. before and Thurs. after Gen. Mtg., V.h.f. Group 1st Fri. (Chair VK2ZGW/T, Sec. VK2ZNA), S.w.l. Mtg. 3rd Fri., Theory Classes 2 nights weekly; Correspondence Course, VK-2IR, Y.R.C.S. Supervisor VK2BSJ, W.I.C.E.N., VK2GN, Disposals VK2ZIM (store at rooms open 1st 2nd and 4th Fri. and 2nd and 4th Sat. 1330-1600 hrs.); Box 1734, G.P.O., Sydney, N.S.W. 2001, for QSL Bureau VK1/2.

VK2AWI Sun. 1100 hrs., 3585 KHz. a.m., 7146 s.s.b., 52.525 MHz f.m. 53.866 a.m., 145.08 a.m., 146.0 f.m. Sun. 1930 hrs., 52.525 MHz. f.m., 53.866 a.m., 145.08 a.m., 146.0 f.m., 432 a.m. relay, Comm. Off. VK2AXJ, phone 02-798-9021. Hunter Branch Mon. 1900 hrs. 80 mx.

Morse Code VK2BWI nightly 3550 KHz., 1930 hrs. and frequently on 2 mx a.m. by VK2ARF as VK2BWI on 2000 hrs. Wollongong Tues. on 53.962 MHz. a.m. For Morse tapes contact VK2BMK.

VICTORIA

Rooms 478 Victoria Pde., East Melbourne, Vic., 3002, Mon.-Fri. 10-15 hrs., Admin. Sec., Mrs. Enid Bellairs, phone 03-41-3535, Gen. Mtgs. 1st Wed.; Council, 4th Mon.; V.h.f. Group, 3rd Wed. (Chair VK3AUI, Sec. VK3AOT/T); S.w.l. Mtg., 2nd and last Fri.; Theory Classes two nights weekly Mon. & Tues. (VK3ATP, VK-3AUJ); Correspondence Course, VK3ZZP and VK3AOH, Y.R.C.S. Supervisor VK3ZDK; W.I.C.E.N. VK3TX, Disposals VK3AS (Box 65, Mt. Waverley Vic., 3149); Inwards QSLs to rooms or Mr. E. Trebilcock, 340 Gillies St., Thornbury, Vic., 3071; Outward QSLs to rooms or VK3XM (stickers $1.50 per 100).

VK3WI, Sun. 1030 hrs., 1825 KHz. a.m., 3600 s.s.b., 7146 a.m., (7135 after 1100 hrs.), 53.632 MHz.8 a.m., 144.5 a.m., 146.0 f.m.; Chair B/C Com., VK3AUI, phone 03-288-2794. (Call back 1st Sun. of month by a Zone station on roster.)

Morse Code Lessons at rooms, Thurs. by VK3JL.

QUEENSLAND

Address P.O. Box 638, G.P.O., Brisbane, Qld., 4001, Mtgs. at Qld. Motor Sporting Car Club, 23 Boyd St., Bowen Hills; Gen. Mtgs., 4th Fri., Council, 1st Thurs., V.h.f. Group, 3rd Fri. (VK4ZHA); Y.R.C.S. Supervisor, VK4EV, QSL cards to above address.

VK4WI Sun. 0800 hrs., 3580 KHz., 7146, 14342, re-broadcast by VK4IO on 52.4 MHz. and VK4IE on 146.0 MHz.; B/C Off., VK4HB.

Morse Code Tues.-Fri. 1930 hrs. 3580 KHz.

SOUTH AUSTRALIA

Address P.O. Box 1234K, G.P.O., Adelaide, S.A., 5001, Mtgs. at Master Builders' Assn., 47 South Terrace, Adelaide; Gen. Mtgs. 4th Tues. (except Dec.), Council, 3rd Fri.; V.h.f. Group, 1st Thurs. at Goodwood Boys' Tech. High School (classroom on N. side), Lily St., Goodwood (Chair VK5QH, Sec. VK5QZ), Y.R.C.S. Supervisor, VK5OD; QSL cards, VK5RX.

VK5WI Sun. 0930 hrs., 1825 KHz. a.m., re-broadcast by VK5KF on 7146 a.m.; B/C Off., VK5XY.

WESTERN AUSTRALIA

Address: P.O. Box N1002, G.P.O., Perth, W.A., 6001, Mtgs. at Science House, 10 Hooper St., West Perth, Gen. Mtg., 3rd Tues., Council, last Fri. W.A. V.h.f. Group, 4th Mon. in D.C.A. Workshops Canteen, 86 Guildford Rd., Maylands (Sec. VK6ZAF). Y.R.C.S. Supervisor, VK6LO, W.I.C.E.N., VK6DD; QSL cards, VK6RU.

VK6WI Sun. 0930 hrs., 3900 KHz. s.s.b., 7090 s.s.b. 52.4 MHz a.m., re-broadcast on 2 mx, Sun. 1730 hrs., 14100 KHz s.s.b.; B/C Off., VK6HP, phone 093-80-4379.

TASMANIA

Address. P.O. Box 851J, G.P.O., Hobart, Tas., 7001, Mtgs. at 147 Liverpool St., Hobart, Gen. Mtgs., 1st Wed., Council, 2nd Mon., V.h.f. Group, 3rd Wed. (Pres. VK7ZLH), Y.R.C.S. Supervisor, VK7KK/T, Equipment, VK7ZME, QSL cards to Box 371B, G.P.O., Hobart, Tas., 7001.

VK7WI Sun. 0930 hrs., 3670 KHz. s.s.b., 7130 a.m., 53.032 MHz. a.m., 144.10 a.m. (148.0 f.m. approval awaited), 433.6 a.m. (temp. discontinued); B/C Off., VKs 7FM, 7BJ, 7CT, 7OM and 7AL.

OTHER QSL BUREAUX

QSL Bureaus for VK8, VK9 and VK0, S.w.l's and unlisted calls only, see 1971 Australian Call Book, page 55.

DIVISIONAL OFFICERS, 1971-72

Presidents. VKs 2ACV, 3CDR, 4NP, 5UL, 6HD, 7ZAS.

Vice-Pres.: VKs 2YB, 3YQ, 4MU, 5TY, 5ZKK, 6DD, 6HP.

Hon. Sec.: VKs 2ZTM, 3BAG, 4QF, 5KF, 6ZDK, 7CL.

Treasurers VKs 2ZIA, 2AXC, 4UC, 5TL, 6EU, 7MD.

Fed. Councillors VKs 2GN, 3TX, 4ZGL, 5TY, 6ZDK, 7EJ.

Div. Council members, extra VKs 2AXJ, 2APQ 2YB, 2ZJM, 2ZGW, 2ZNA, 2GN, 3IZ, 3TX, 3AJV, 3AUI, 3AUJ, 3ZCK, 3ZWN, 4AK, 4EV, 4HB 4RL, 4XX, 4ZBJ, 4ZGM, 4ZHA, 5GZ, 5WN 5XY, 6DA, 6LO, 6PG, 6ZK, 7EJ, 7JV, 7VK 7ZMK.

All times quoted are local times; all meetings are at 2000 hours unless otherwise stated.

Membership fees and Federal officers will appear in a later issue.

ZONE AND CLUB DIRECTORY

See also 1971 Australian Call Book, page 58.

VK2 Blue Mts., 3rd Fri.; Gosford, 1st Fri. (business), 3rd Fri. (general), Nepean, 1st Wed., Newcastle, 1st Fri. (except Jan.); Wollongong, 2nd Mon.

VK4 Carnarvon Am. Radio Club, as reqd., Ockley Radio Club, VK4ZBT.

DIVISIONAL CALENDAR

Listen to Divisional broadcasts also.

NEW SOUTH WALES

Sept. 19 "Open Day" at Sydney Technical College, School of Applied Electricity from 1000-1700 hrs. Exhibits in class rooms in Building 20 (old Syd. Tech. College, off Harris St., Ultimo) and Building 38, second floor (ex Marcus Clarke) opp. pedestrian crossing at Railway Square.

Sept. 22. 2 mx Fox Hunt.

Sept. 26: Nepean District Am. Rad. Club Annual Field Day at VK2WI, Quarry Road, Dural, 0930 to 1615 hrs.

Oct. 1: "Members Built It" night, Hunter Branch in Room 8, Cleg Bldg., Newcastle Tech. Coll., Tighes Hill, from 2000 hrs.

Oct. 2/3: South-West Area Convention (Area 5) at Grong Grong. Dinner in Grong Grong Hall on Sat., at 1830. Sun. Field Day. Write W.I.A., Box 10, Grong Grong, N.S.W., 2652, for details. (Courtesy VK2AEC)

Oct. 17: Hunter Branch Annual Field Day at Marmong Point Park from 1000 hrs.

Oct. 22 2 mx Fox Hunt.

VICTORIA

Sept. 19 V.h.f. Group Rally at Gembrook Sports Ground 0900 to 1630 hrs. (VK3AOT, phone 277-8285)

Oct. 2 Eastern and Mt. Districts Rad. Club Spring Social at Ferntree Gully National Park.

Branch and Club Secretaries are invited to write to the Editor for special advertising rates for W.I.A. activities listings. Future insertions of the Calendar will have to be severely restricted in length.

— . . . —

CORRESPONDENCE COURSES

The VK3 Course Supervisor reports that **Stage 2** of the Correspondence Course has been re-written and considerably improved upon. Therefore, all affiliated Clubs who have been previously issued with complimentary copies for their own internal classes are requested to write to the Course Supervisor via the VK2 rooms advising the approximate date on which they received their first copies. On receipt of such advice, a new copy will be despatched. **Stage 3**, first section has been similarly updated and is also available. **Stage 1**, very much in need of substantial editing, is now being put to stencils and will be available later in the year. (C. Bardwell, Course Supervisor)

R.D. CONTEST

Have you sent in your Log?

VHF

Sub-Editor ER.C .AM ESON, VK5LP
Forreston, South Australia, 5233.
Closing date for copy 30th of month.
All Times In E.S.T.

AMATEUR BAND BEACONS

VK0	53.544	VK0PH, Casey
	53.032	VK0TM, Macquarie Island.
VK3	144.700	VK3VE, Vermont.
VK4	144.380	VK4VV, 107m. W. of Brisbane.
VK5	53.000	VK5VF, Mt. Lofty
	144.500	VK5VF, Mt. Lofty
VK6	52.008	VK6VF, Bickley, Perth.
	52.900	VK6TS, Carnarvon.
	144.500	VK6VE, Mt. Barker.
	145.010	VK6VF, Bickley
VK7	144.900	VK7VF, Devonport
VK9	144.600	VK9XI Christmas Island.
ZL1	145.100	ZL1VHF Auckland.
ZL2	145.200	ZL2VHF, Wellington.
ZL3	145.000	ZL3VHF, Christchurch.
JA	51.995	JA1IGY, Japan
W	50.091	WB6KAP, U.S.A.
HL	50.100	HL8W1, South Korea.
ZK	50.100	ZK1AA, Cook Island.
KH6	50.101	KH6EQI, Hawaii.
	50.015	KH6ERU, Hawaii.

There are some changes to the beacon list this month. Two letters this month concern operations in the Antarctic region. Firstly, Mike VK3ASQ advises that the Casey beacon originally known as VK0GR has now been taken over by Phil VK0PH and operates under that call sign, using keyed c.w. at 5 w.p.m. Transmitter runs 120 watts d.c. input to a pair of 6146 valves, antenna 3 el. yagi 20 feet high, and operates for 23 hours per day. Phil listens between 1900 and 2000 hours daily, and also operates on 14.120 MHz. at 1900 Monday, Wednesday and Friday

Also from Mike comes word of a further beacon, VK0TM, on Macquarie Island, operated by Fred, 68 032, using a Lafayette HE56B transceiver, running 15 watts c.w. Phil reports hearing this beacon late in April, a distance of about 1,100 miles. So the possibility exists of the first VK0 to VK0 QSO on 6 metres in the future. As a matter of interest, the VK0PH beacon will shortly be voice modulated using a tape loop. (Whilst there is some merit in this, I do feel that keyed c.w. is the best method for beacons, being a mode more suited for difficult conditions. A mixture of voice and keyed c.w. may be a compromise to be considered!—VK5LP)

Also on the subject of the "cold country" beacons is a letter from Roger VK3ZRY, ex-VK0GR 2nd op. He reports the location of Casey Base as being Lat. 66 degrees 17 minutes South, Long 110 degrees 32 minutes East. This heading is also suitable for South Africa from the southern States, and a Great Circle path running through Mawson and Casey very nearly coincides with Melbourne. People living between Albany and Fremantle can aim their beams just West of South and will be very close

Roger goes on to say that he has brought back the log of VK0GR and would be grateful if people could assist him by sending any reports, HEARD or NOT HEARD, and details of the times they listened, equipment details, beam heading, etc. The beacon was first put into operation on 6th January, 1971.

Some equipment details: Transmitter consists of 6AC7 crystal oscillator, 5L6G doubler/driver and two 6146s in push-pull. The driver was run from an electronically regulated supply. The keyer was later modified and a keying relay keyed from a contact wheel. Some trouble was experienced with the 3 el. yagi. Designing and building an antenna to survive 60-plus knots blizzards presents a few problems!

Being very interested in propagation to and from Antarctica prompted Roger to build the beacon, particularly as the amount of sporadic E which extended to the higher frequencies as recorded on the ionosonde equipment confirmed his interest. Any help you may be able to pass on to Roger would be greatly appreciated.

Thank you chaps for your information on Antarctica, it has filled a gap standing for some time. The coming summer months may well be a time for confirmed contacts between Antarctica and Australia, particularly if you bear in mind that Macquarie Island is about 700 miles south of Tasmania and could be good for single hop from the mainland.

THE VICTORIAN VHFer

Congratulations to the editor and other helpers on the production of a fine journal covering the v.h.f. scene in VK3. There is plenty to read in the 18 pages presented in the first issue, which arrived on my desk recently. Pleased to note the South-East area of VK5 rates a mention and it is to be hoped this segment will be a regular feature. There's an interesting letter from VK3AFW on a proposal for two metre band planning, quite thought-provoking and worth reading. George VK3ASV describes a mobile antenna (5/8 wavelength whip) which loads and works well on both 6 and 2 metres! George also gives details of the Eastern Zone 2 metre band plan, and so it goes. My copy from Mr Cook, VK3AFW, and I hope there will be items of national interest which I can select for "A.R." from time to time

BEACON FREQUENCIES

The idea of having an exclusive beacon allocation appears to be gaining in popularity, and I believe has much to commend it. Present thoughts seem to be from 144.500 to 144.700, which is nicely placed for the second 500 KHz. tuning segment of the average s.s.b. transceiver when using the 28 MHz. band for v.h.f. tuning (and most people do!). It will also mean that the average yagi, say 10 elements, will still have useable gain in that segment even when cut for near the band edge. It also keeps the beacons, which must be considered DX, in an area free from usual high activity interference. It would be nice in any changes being made in the future to beacon frequencies to have them in some better order, perhaps 144.510 for VK1, 144.520 for VK2, 144.530 for VK3 and so on. However, I don't believe this is as important as ensuring all beacons are left uncluttered by other signals, and for this reason alone it would be well worth getting them together somewhere on the band. What do you say? A final thought, capital city beacons could be between 144.500 and 144.600, out-of-town (country) beacons in areas like Eastern Zone of VK3 could be in the segment 144.600 to 144.700. Agree?

ZL OPERATION ON 6 METRES

A letter from Geoff VK3AMK advises that "ZL2BFR will be operating at 1200 feet a.s.l. east of Palmerston North during a 6 metre contest on 26th Sept., 1971. Operation will be 0800 to 1200 E.S.T. with four 1-hour periods. Power approx. 30 watts to 3 el. yagi. He will be looking for possible VK contacts. Modulation will be a.m." Geoff realises it might be a bit optimistic for the time of year, but one never knows. He mentions also that it is unfortunate many ZLs tend to operate just below 52 MHz., which makes it very difficult for those areas subject to Channel 0 trouble, with their sound carrier on 250 KHz. below

I agree Geoff, it is a problem, but it is little use the ZLs moving amongst our crowded lower end of 52 during DX openings, and their antenna gain will start dropping off seriously if they move up towards the latter half of 52 MHz., as their antennas are more likely to be cut for about 51.5 MHz. So it seems New Zealand stations looking for contacts into VK2 or VK4 should operate nearer 51 MHz. than 52 MHz. to give the VK operators a chance. Geoff himself will be active on both 2 and 6 metres this coming season on s.s.b. Thanks for the letter

S.E.R.G. CONVENTION

Colin VK5DK reports from Mt. Gambier of another very successful Convention during the June holiday week-end. Total attendance, about 150 people with 68 Amateurs or S.w.l.'s registering. Five VK9s came over by plane, which shows there are some keen types around, and speaks well for the reputation of the Convention. A couple of points of interest in that a perpetual trophy has now been awarded for the Amateur showing the most outstanding success at the Convention. It is a 4CX10,000A tube suitably mounted and inscribed, with the winner's name on a small shield. This year it was won by Kevin VK2ZYP

The "sniffer hunt" was somewhat different from last year. Colin VK5ZHJ had the tx tucked in his pocket while walking along with the "hunters". There were some very puzzled people with their beams giving queer readings and being omni-directional! The 80 metre hidden tx hunt, run for the first time this year, was a tragedy for the h.f. operators as the first three places went to Z calls!

QSL CARDS

I have received several pleas from writers asking can I help to get a better return of QSL cards from various v.h.f. operators. I can't really help other than to appeal to operators to at least send a QSL upon receipt of one from another Amateur. After all, he may be needing cards for VHFCC, WAS, etc. You may have the award, perhaps he hasn't!

BAND ACTIVITY

Band activity generally has been quiet and portion of the past month of course I was away on holidays. Lindsay VK4ZIM on 6 mx came through briefly on 1st August in the middle of the VK5 Intra-State Contest, noticed Mitch VK5ZHM working him. Wally VK5ZWW and Bob VK5ZDX have both been active on MS to David VK6AU and I am hoping for a report on their latest activity as a stop press item.

No other news has come to hand for the moment and I hope to get the 'Meet the Other Man" segment running again soon. In the meantime, news must end at that point, with the thought for the month: "If you can give your son only one gift, let it be enthusiasm." Until next month, 73, Eric VK5LP

— . . . —

REPEATER NEWS

The current VK2 Repeater position is a Channel 4 in Sydney, and a Channel 1 in/Channel A out system operates at Orange in the Central West. A Channel 4 application is awaiting approval for Newcastle. Channel 1 applications are being prepared for Gosford, Wollongong and Wagga by the Repeater Sub-Committee of those areas.

Dural: From Sept. 20 last year, Sydney Channel 4 Repeater has been operating from Dural. Present system uses A.W.A. valve equipment. A new m.o.w. identifier in form of IC keyer will replace previous mechanical system. Future plans include a solid state tx and rx, leaving the present system to become the stand-by available on a remote changeover (VK2ZTM)

Wollongong: Being rapidly assembled by rep. sub-com. members and others. Repeater experts from Sydney attended a recent sub-com meeting and much was gained from their comments. A request has been made for manned operation on Channel 1 and it is hoped that P.M.G. permission on a test basis will soon arrive. Call sign—VK2AMW/R. VK2ALU,

VK7, Mt. Barrow: A new application has been submitted for Northern Tasmania, using Channel 1.

Melbourne: The Channel 1 system has been moved to the Dandenong area which has provided improved coverage.

CORRESPONDENCE.

NOVICE LICENSING

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the Publishers.

Editor "A.R.," Dear Sir,

I am very impressed with the letter from VK3RN which you published in "Amateur Radio" for July. Ron is not happy about the lack of balance in the published correspondence. This is right and his first column on page 26 is a very sound statement of facts.

I would like to suggest that the people who are in favour of Novice licensing have listed countries like France, Germany, England, Italy, Switzerland and Sweden as being without Novice licensing and therefore backwards technically, when in fact they would not condone the idea.

Let us not be carried away by statistics which state that Australia is somewhat retarded (as far as Amateur Radio is concerned) because about 1 in 2,000 of population hold an Amateur licence. The object of urgent importance should be to make all these people members of the W.I.A., then worry about increasing the ratio of Amateurs per head of population. The attitude of the office-bearers and members of the W.I.A. should be to make membership more attractive so that that dreadful deficiency which exists between the number of licence holders and members of the W.I.A. is reduced to nil. By doing this almost ALL of the problems listed in appendix "D" can be solved.

The sub-committee has suggested that if we had Novice licence holders, they should be accepted as Associate members of the W.I.A. We all know that this fee is insufficient to swell the finances of our W.I.A. and a full member is the type we must foster.

I think Ron has put the finger on the spot when he suggests that the Radio Inspectors' Branch would have to further increase licence fees very considerably to cover the administration of Novice licences and I don't have to remind you about the increase in b.c.i. and t.v.i. The latter is usually caused by lack of experience and who could be less experienced than a Novice?

The reference to school boys taking an interest in Amateur Radio as an extra activity is fine and more boys should be in it, but you don't need a Novice licence of lower standard to encourage the boys to sit for the Amateur certificate. Let me state that I know of a number of boys who in the course of doing their Leaving or Matriculation course at a high school have sat for the A.O.C.P. and passed without any preparation whatsoever if they were doing physics at school. Any intelligent boy who is accustomed to doing examinations during his schooling can sit for the A.O.C.P. and pass if he learns Morse, and the Regulations can be learned in one evening prior to the examination.

With reference to the 160 metre band, let me tell you that there are many "old timers" who are fostering DX on this band and enjoying excellent results.

The reference to handicapped persons has been adequately covered many years ago by the Radio Inspectors' Branch and I fail to understand why the sub-committee even lists this point.

Finally, Sir, please allow me to offer my congratulations to Ron Higginbotham, VK3RN, through your correspondence columns, for a long and very informative letter in favour of NO NOVICE LICENCE and commend his pearls of wisdom to the sub-committee and all Amateurs.

Supposing you are not a member of the W.I.A. and resent the suggestion of introducing Novice licensing to Australia, why not then join the W.I.A. and fight for your rights?

—Ivor Morgan, VK3DH
(Licensed, March 1930)

Editor "A.R.," Dear Sir,

I have heard a lot of emotional argument on Novice licensing and think that a rational look at the broad situation would help.

I feel that any changes to the existing "set up" should follow two basic principles.

(a) Be of significant (measurable) benefit to the Australian Amateur Service.

(b) Have no possibility of doing any harm to the Australian Amateur Service.

Doubt has been cast as to whether Novice licensing would bring any benefit.

If we (the W.I.A.) support Novice licensing, then let us suggest a trial period of, say, 3 to 5 years, after which if promised benefits do not result, then it can be cancelled.

Why further carve up existing bands? Let us ask for an extra 25 KHz. on selected bands as a condition of Novice licensing. This would benefit everyone and eliminate the very real possibility of losing band portions allocated to Novices if the system does not work.

I am not yet committed but do lean a little towards the "NOES" until I am convinced the two principles mentioned can be met.

M. N. Oburtill, VK3WW.

Editor "A.R.," Dear Sir,

As I cogitate upon the pros and cons of the proposed N.L. scheme, I'm struck by the fact that the same old fragmented situation exists, as it does in most of man's structured affairs. In this case, those who will be affected most and worst, by the introduction of N.L., so far have hardly been mentioned. These are the c.w. men, who because of their comparative minority, will have the least say—or probably no say, at all—in the allocation of N.L. frequencies. DX men use the low end of all bands, simply because that is where most of the rare stations appear from time to time. Now we have the Investigation Committee suggesting frequencies for those at the c.w. periphery, without understanding the true state of the art on this part of the bands.

My objection to what is set out in Appendix "B" in the Report, is that the frequencies allocated will not be in the best interests of the Novice, the Advanced C.w. Op., or the International Scene generally. Novice operation on 3505, 7010 MHz. will cause considerable QRM and conflict with International DX.

The N.R.R.L. at the 1969 I.A.R.U. Region 1 Conference in Brussels introduced an amendment (because of the aforementioned trouble—QRM) that the first 10 KHz. of 80 metres be preserved exclusively for Int. DX. After discussion, this was agreed upon (I.A.R.U. Newsletter No. 13). This agreement made at the Conference concerns only those Hams in Region 1, but it is in the interests of all to co-operate as much as possible.

A similar situation exists on 40 metres, where the first 15-20 KHz. are used, primarily, by those seeking DX. The N.L. committee in its report on frequency allocation states, and I quote "There is very little c.w. activity on this band (7 MHz.)" During daylight hours this is correct, but for the period of darkness this statement is **entirely incorrect**. This band, and to a lesser extent, 80 metres, is simply packed with DX from Asia, Europe and U.S.A., particularly during the Spring, Summer and Autumn months.

I can imagine the comments and strife among locals where a Novice is calling CQ on 3505 or 7010 when these bands are wide open to other Continents. The practical result will be that some good DX QSOs are lost and the Novice annihilated. Now, let's be sensible and shift the l.f. edge for N.L. to 3510, 7020, 21060, 28060 MHz. This will allow smoother, conflict-free operation all round and not deprive the Novice in any way—rather, it will enhance his chances to work DX. If the F.E. wants to increase the drop-out rate in Novices, then it should adopt the frequencies (low side) as set out in Appendix "B". To do so, will be to throw the Novices to the wolves.

The N.L. committee, in Appendix "C" of its report, lists ten overseas countries which permit Novice operation. Four of these countries have had the foresight to keep the Novice out of the International DX zone, the other six, have not. Japan is in this latter group and bears a mention. The JA Novices are now so numerous, and the QRM so bad, it is often impossible to work DX because of their incessant calling—something to ponder on, for A.R's future. It would be safe to say that Japan's Novice frequency allocations are not popular, nor do they work in the best interests of International DX.

It is some considerable time since I listened on the top band, but I feel that those who go to the trouble to build gear and erect special antennas in an effort to work DX on 160 metres should have the privilege of a few KHz. at the low end to themselves. We are approaching a period of low sunspot activity, which means that the LF's will be in big demand by DXers.

My above remarks may be interpreted by some as claiming undue rights for the advanced c.w. operator. Yes, I do feel these chaps should have some consideration in this regard, but it is equally important also that the Novice, with his QRP 10 watts, does not have to compete with undue QRM.

The strong anti-N.L. stand taken by VK3RN calls for a comment, or two. Mr. R. Higginbotham raises one or two very pertinent points, which the F.E. could profitably examine further, viz. the method of N.L. examinations and the surveillance of their subsequent operations. In general, though, I feel his article in "A.R." July '71 is over-reactive and few of the bogies raised would ever come to pass. Also, to predict N.L. trend in VK from figures obtained from A.R's immediate past history in the U.S.A. is, for me, too assumptive and hypothetical.

However, if F.E. accepts as a fair proposition the nitty gritty nub of VK3RN's argument, that Novices will form approx. 3½% Ham population in VK and that the relatively small number of 136 will become W.I.A. members (this figure of 136 would be valid for one particular year only), it might rightly give thought to dropping the scheme altogether.

Is there any sound basis for the assumption of 3½%? I hardly think so! The U.S.A. has six classifications of licensing—we would have only three. N.L. in U.S.A. is established—our proposed scheme is yet to come into effect. It may be that initially there will be a rush of Novice applicants before things settle down. Then, and only then, can any real evaluation be made.

On the question of N.L. examination costs to the P.M.G., the latter might consider a scheme which works well, in some countries (I am told) whereby tests of this primary level are carried out by a panel of voluntary examiners drawn from the ranks of the W.I.A. As far as operating standards on the bands are concerned, this, surely, is up to us to keep our own house in order by setting up "Assistance Groups" to help the newcomers.

Finally, may I make a few short comments on further points made by R.H. VK3RN. Code at 5 w.p.m.; yes, a little slow, but acceptable rather than complicate procedures. Most ops. soon go from 5 to 10 w.p.m. in a matter of a few weeks.

Re exam. jitters and the lack of ability to communicate via the written or oral words. This is common to all examinations and not peculiar to A.R. in any way.

Why do Argentina, Canada and N.Z. show better Ham-to-population ratios than VK? One possible reason is climate, more indoor pastimes in colder countries.

Why the variance in Ham-to-population in VK States? This is not unduly abnormal. Some States are small, others large, each have different populations; some have large cities concentrated in small areas, others have smaller towns widely dispersed with poor communication. Hams become Hams, partly by their own efforts and initiative but also by the influence of others. However, I do agree with VK3RN that the VK2 ratio needs looking into.

Will a Novice xtal-controlled on 10w cause more BC/QRM than the full licensee on 200 p.e.p. input? No.

What will the drop-out N.L. do with his gear? Same as the full ticketed Ham does, when he quits.

School studies of teenage would-be Novices might suffer, if they become too involved fiddling with A.R. I doubt if there is any foundation for such a premise. Ye gods, any hobby that keeps lads interested and off the streets must be deemed well worth while. A.R. exists for the purpose of encouraging the study of electronics and to give aid, advice and instruction to those interested.

My vote on N.L. is YES with the above reservations and the suggestion that it be undertaken on a 5 or 7-year test period. Then, if unresolvable snags persist, the scheme can be scrubbed without finger-pointing and in the knowledge that it had a fair trial.

—Al Shawsmith, VK4SS.

Editor "A.R.," Dear Sir,

I have read with considerable interest the Novice Licensing Report in the Federal Convention Minutes and am in general agreement with the concepts and decisions as far as they have gone. In particular, I like the idea of modernising the A.O.C.P. theory exam. to a more accurate and searching form.

John Anderson, VK7ZFO.

Editor "A.R.," Dear Sir,

I am against Novice type licensing as is generally being proposed, however I am for some type of licensing for the beginner.

To lower the present theory standard would take a necessary fundamental from the Amateur Service. Alternatively, if c.w. becomes a pass to Novice licensing on tenancy basis, imagine the persistent influx of pirates after a few years.

(continued overleaf)

It seems to me that we have a communicability gap. We refer to Amateur Radio as a hobby; to the layman it is a vocation for technicians and intellectuals. If our "layman" is employed on the production line of a motor assembly plant, or wherever, chances are that he will never enter the Amateur Service. If our friend is engaged by an electronic industry he will receive the basic grounding in electrics, theory and practice so necessary as a background to Amateur Radio. How many lads employed by the P.M.G's Department operate their own stations?

In short I am convinced that there should be some legal and easier way for all persons interested in radio communication to become Amateur operators of some designation.

Okay, so I've heard the argument, "If you fail the theory, sit again and again," and so on. The writer is an acquaintance of two television servicemen who are proprietors of two very successful businesses. Each has sat for the A.O.C.P. and failed, one is adept at c.w. This happened some years ago. These people often become reticent and regrettably end up by dropping the whole idea or worse perhaps, by mildly pirating. They are often bachelors or conversely, dedicated family people with little time to spare.

With the right encouragement they would contribute to Amateur Radio with their resources, ideas and activity.

Most of us are aware of the illegal use of Amateur and other frequencies. I believe the existing legislation to be the greatest contributing factor to this problem. How many Hams pushed the button before gaining their tickets?

Wayne Green, editor-publisher of the popular "73" magazine, came up with an idea last year to encourage radio as a hobby for all and a stepping stone to full licensing. I believe it will work! An Amateur Hobby Class licence on part of 420-450 MHz, or perhaps part of 144-148 MHz. Base stations only up to 25w of f.m. or s.m. emission, beams giving operators extra range and interest to design and construct v.h.f. and u.h.f. antennas, etc.

No code or theory but a rigid test on station operation, regulations and safety. Good quality u.h.f. transceivers are now available for around $300 and within a few years there will be good used rigs on the market at prices the beginner can afford, v.h.f. rigs are always available at reasonable prices. All station equipment would have to be P.M.G.-approved. A Call Book would give the hobbyists respectability, therefore the Service would be self policing for the most part. Doesn't Commercial Radio work this way? The restricted power and higher frequencies would encourage the intelligent operator to study for the A.O.C.P. to make use of the DX bands.

American C.B. operators rarely try for their full ticket because they have the use of the "skip" frequencies, hence the term given them by the Hams, "appliance operators". When the American business fraternity realised that the u.h.f. frequencies wouldn't "bend", they influenced the F.C.C. to lower the C.B. band to 11 metres. The results are well known to most of us; we can learn from their mistakes.

I would be pleased to see the Wireless Institute get behind these proposals. I realise that International Agreements have to be considered with respect to the code if this proposed Service is to come within the jurisdiction of the Amateur Service, however as the u.h.f. bands are generally incapable of DX work, code should not be of any consequence. If the Australian Post Office, for instance, establish a Citizens Band type service in the h.f. or v.h.f. bands we will have failed to take the initiative by not campaigning earlier for a similar service within the Amateur frequencies.

It should be obvious that this type of service can be better controlled within the Amateur bands and would bear more fruit for Amateur Radio and the Institute.

The present 11 metres handphones will have to remain for essential services such as boating safety, limited business and so on, but the new licence should draw off most of the illegal users from the handphone band.

The writer has experienced the sincere co-operation from Amateurs to interested newcomers, I have no doubt that the Hobby Class licensees would gain much from fraternisation with the "old hands". It follows that there would be a natural progression out of the ranks of hobbyists to higher class licensing, those who remain can carry on rag-chewing or whatever, much in the same way as the short range two metre enthusiasts.

To quote Mr Rex Black, VK2YA, Chairman of the Novice Investigation Committee and founder of the Youth Radio Scheme, "There are certain people of my own acquaintance who will NEVER attain the examination techniques to pass the A.O.C.P. test, but who have definite skills in practical aspects of radio and certainly could turn into effective and reliable operators."

In my opinion the mathematics of radio theory and the music of code do not appear to be within the capabilities of the majority.

For the record, the New Zealand Post Office has provided a means for those interested in radio communication by the introduction of a Citizens Band licence. They have 7 channels from 26.425 to 26.575 MHz and 1 channel on 465 MHz. Transmitter power runs from ½ 3w with a.m., f.m. and p.m. emissions and external antennas provide added interest. A reliable source informs me that the ZLs conduct their C.B. stations very well indeed and their Hams are quite happy with them.

I am confident that my proposals are a further improvement on the New Zealand scheme and I feel that they should be at least considered at executive level.

Some folk think we need both Novice and Citizen Bands, but I am convinced that an Amateur Hobby Class licence, if carefully conceived, can fill all needs. I believe it to be inevitable.

Let us be prepared to change, renew and rejuvenate ourselves and our interests.

—M. R. Morris.

Editor "A.R.," Dear Sir,

This is to express my favour of Novice licensing.

I have considered the facts, both for and against, and my feelings are that any problems which do arise can be overcome with the help of both the P.M.G. and the Amateurs themselves.

If the majority are for the issue of the Novice licence, I wish the W.I.A. every success with its task.

—J. W. McCulloch, VK3BEQ.

Editor "A.R.," Dear Sir,

I was somewhat relieved to read VK3RN's correspondence in the July issue regarding Novice licensing.

I have read with unsettled interest many recent articles on this subject and also found they were all in favour of this type of licence. Thinking I was 'odd man out,' I have sup-

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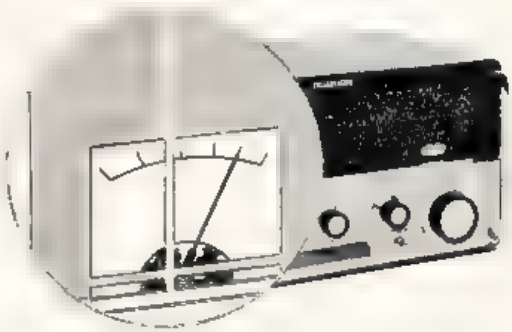

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pressed my views perhaps like many others. I also found Mr. Higginbotham's views, which are undoubtedly the result of a considerable amount of research, most enlightening and thought provoking.

It would appear to me there are quite a number of the Amateur fraternity who look upon Novice licensing as inevitable, to whom I would ask, look again and find a realistic answer to these questions:

What is the expected cost of Novice licensing in dollars alone for the P.M.G. Dept., excluding manpower (of which they are already in dire need) and what bearing will these costs have on future licence fees?

Will the status Amateurs now enjoy be decreased with the introduction of a lower standard of examination, not forgetting the possibility of an increase in t.v.i. and b.c.i.?

What is the real purpose of Novice licensing? If for the sole purpose of increasing the Amateur population, what alternatives are there?

Again I would ask all Amateurs to take a long look at the whole aspect of Novice licensing NOW and ensure the outcome, whatever that may be, will be the right one.

—B. R. Hartley, VK2FE.

TARIFF ON TRANSCEIVERS

Editor "A.R.," Dear Sir,

You recently gave publicity to the lifting of tariff on Amateur band s.s.b. transceivers, and to the fact that tariff was hastily re-imposed by the Customs people at the request of Australian firms who claimed that they were producing "goods" and required tariff protection.

Enclosed is a letter from one of the firms involved, quoting the price of their locally produced "efforts". This letter reveals a Gilbertian situation, with the Duke of Plaza-Toro handing over some of his home-grown Toro produce on a plate to our Customs authorities.

Note that even with 45% "protective" duty imposed on the imported product, the local firm's prices are still 300% to 400% higher than that of the imported article.

Words fail me!

—J. R. Elms, VK6BE.

Extract of a Letter from . . .

20th July, 1971.

Dear Sir,

We acknowledge receipt of your letter regarding amateur band high frequency transceivers.

The units that we manufacture are made to P.M.G. specification RB 209, and can be supplied with or without 1 or 2 VFOs.

The receiver is fully solid state and the transmitter is solid state to the final stage. The prices are as follows:

100 watts PEP — $1,340.00
500 watts PEP — $2,320.00

Thanking you for your enquiry,

. . . . . .

"DX-PEDITION WITH THE ACITRON TO BY"

Editor "A.R.," Dear Sir,

According to "A.R.," July, Acitron SSB-400 is the first Australian rig to hit the market.

With the snow-balling thaw in China, what a wonderful opportunity it would be for Australia to be in first before Swan, Heathkit, Yaesu and the rest?

We have heard many Chinese commercial stations, but never a BY—assuming they will be given the same opportunities as UA in good time. Why not start now and encourage a VK team to demonstrate by way of a DX-pedition with the Acitron to BY? The time to plan is NOW.

—Jack Dunne, VK3AXQ.

☆

9M8 LICENSING

Applications for a licence to operate in Sarawak should be addressed to: Telecommunications State Headquarters (Tabatan Tali-Kom), Were Road, Kuching, Sarawak, East Malaysia.

A photocopy of the current VK licence should be enclosed.

The licence fee is 30 Malay dollars and official clearance through the Sarawak Tourist Association, Box 887, Kuching, appears to be necessary. United States citizens appear to have had few difficulties in obtaining a reciprocal licence. There is no reciprocal licensing arrangements between Australia and Malaysia.

—H. F. Evertick.

DX

By H. F. EVERTICK
C/o. P.O. Box 36, East Melbourne, Vic., 3002
(Times are in G.M.T.)

Czechoslovakia (courtesy VK4SS): Three prefixes have been in use. OM only in 1968 to celebrate 50th year of Independence and the two current series of OK and OL. Club stations (about 500 out of the 3,500 licensed stations) carry three-letter suffixes beginning with K, O or R. Foreigners on reciprocal licensing must use call sign of station being operated and their own call signs, thus OK-2BAA/SP1AA. The numerals in use indicate locality or speciality, thus OK1 Bohemia, OK2 Moravia, OK3 Slovakia, OK4 mercantile marine shipboard, OK5 and OK6 special occasional, OK7 non-Amateur experimental and OK8 foreigners.

PX Hunters ("CQ" Mag. Aug.): KQ0NEB Sept. 1-9 all bands c.w. and s.s.b., by Lincoln Nebraska Am. Radio Club for 1971 Nebraska State Fair.

Ryuku Islands (KR6) (ISWL): When these islands revert to Japan in Jan. 1972 IRCs will be useable. At present these are not exchangeable except by operators using them to send elsewhere.

Sark (Tnx Eric L3042): From Don G3HZL comes news of a Sark Island DX-pedition protected Sept. 15-21 continuous, c.w. and s.s.b., 1.8 (2000-0500z) to 28 MHz. Various call signs from GC3HZ, GC3VUQ, GC3YCQ, GC5ATJ and another GC5 (DJ5PN reciprocal call not yet known). Skeds arrangeable via Don. GC5ATJ may be active spasmodically for an additional two weeks.

Sark is the most central of the independent Channel Islands group between France and England, is hilly with precipitous seaside cliffs, motor vehicles banned and served by hydrofoil service from St. Peters Port in Guernsey.

QSL Information (Long Is. DX Assn. Bulletin, D.O.T.M., and ZL4NH):

CR3ND—CT1BH	VK3C1F—W2GHK
CT2AK—K4EVY	YJ8BL—W6NJU
C3IAZ—F9UX	2A0FN—WA4WME, DL4VA
C3IDP—ON5TO	3C1EG—OH2NB
FB8ZZ—F8US	5X5NA—G3LQP
FK8AR—F2GTE	

Awards ("QST"): DXCC endorsements—VK5MS 340.

Contest Diary: Oct. 2/3 VK-ZL-Oceania (see July "A.R." p. 19); Sept. 11/12, European DX; Oct. 9/10, R.S.G.B. 21/28 MHz. phone.

Willis Island (courtesy The Bairnsdale Advertiser): John Martin, VK3JW, of Wy Yung, one of the group with Larry Pace, VK4CGB, who recently activated Willis Is. among the millions of chattering birds is pictured here whilst operating on the island. The postponed trip to Mellish (caused by bad weather) might eventuate later in the year.

John Martin operating at Willis Island

Contest Results ("CQ" Mag.): 1970 "CQ" W.W. DX (phone) Contest—(a) Single Op., all-band, AX6HD, 2 181 240 pts.; AX6RU 1 121 952; AX2APK 607 128 (won by KV4FZ 4 961 551 pts.); (b) Multi-Op. single tx, AX2APX/Lord Howe Is. 640 156.

WPX Endorsements: VK3AHQ 850 (c.w.); (W4OPM at top with 1050).

Clubs (from Radio Newsletter 10th July): 29 DX Club of Western Aust., VK6II, affiliated to R.S.G.B.; meets monthly 4th Tuesday (?), Sept. at QTH of L60101; Oct. at VK6DD; Nov. at VK6KK.

Old Timers' Club (courtesy VK2ADE): Licensed Amateur operator for 40 years and over, formed 1947 in U.S.A., adherence to a Club Creed which is sensible and contains a clause to gather historical data, issues "Spark Gap Times" bi-monthly, and a "Blue Book". The Secretary is W6MLZ, 1300 members world wide and include VK2ADE, 2NS, 3CB, 3LC, 4VR, 5JT and 6KK.

Quarter Century Wireless Association: Licensed Amateur operator for 25 years and over, formed in 1947, issues Year Book and QCWA News quarterly, about 5,000 members world wide with 48 Chapters. The Sydney Chapter is the only one outside the U.S. and Canada, was formed 1969 and meets second Wed. each month at a local club for dinner and lecture or talk. Members include VKs 2ADE, 2AGO, 2AND, 2DA (chairman), 2DI, 2EN, 2IJ, 2OI, 2OJ, 2PF, 2RA, 2VN, 2WD, 2XT, 2YP, 3ZH/T, 2ZQ and 4MY.

Boundaries of I.T.U. Region 3: (Approx.) S. Pole up 60 deg. E. Lat. to Iran, thence E. to include Iran, Afghanistan, mainland China, Korea and Japan to an oceanic point S.E. of the tip of Kamchatka, thence south-eastwards to a point 10 deg. S. 170 deg. W., thence along Lat. 10 deg. S. eastwards to 120 deg. W., thence back to S. Pole.

Darlene 3B9DK, writing from Rodriguez Island on 13th July, said in the three weeks she had over 2,500 QSOs in 135 countries with the Swan 500C to an inverted vee, up 70 ft. She gave a thumbnail sketch of the island as about 5 miles by 7 miles, rather mountainous, rocky, volcanic origin and almost entirely surrounded by a coral reef. Population about 25,000, including 20 Europeans, of whom about half are missionaries.

Her future plans appear to include return to Mauritius late in July, air trip to Dares Salaam for touring in 5H3 and 5Z4, followed by a flight to Mahe to Jack (VQ9XX) and Maureen (VQ9YL) Roberts cruising round the world in a Chinese junk "Intrepid Dragon". It seems they plan a trip from the Seychelles to Aldabra and possibly Comoro, thence to Beira. Darlene may then go on to JY on invitation about late Sept. before her European safari which might include a DX-pedition to 3A in November if DL7FT can organise a licence for her.

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Sun's X-Rays to be Mapped

A daily x-ray map which will show the source and level of x-ray activity on the sun is one major objective of a satellite package being developed by Lockheed Missiles and Space Co.

X-ray activity on the sun can be associated with solar flares and sunspots, which have a profound effect on radio transmission. These phenomena are indicators of great energy storms on the sun. But even more, a study of how and where these x-rays are generated, and their energy levels, could lead to a new knowledge of the physical nature of the sun.

Described as a "mapping x-ray heliometer," the package is being prepared under contract to N.A.S.A's Goddard Space Flight Centre for flight aboard OSO-1 (Orbiting Solar Observatory, Mission "eye"), which will scan the sun.

General objectives of the mapping x-ray heliometer experiment are to make detailed observations of x-rays emitted by the sun. These studies are aimed at:

- Determining more about solar behaviour, including how frequently x-rays arise from particular regions of the sun.
- How such x-ray activity may correlate with optical and radio observations.
- What makes x-ray activity rise and fall.
- How soon x-rays can be detected after sunspots appear.

The satellite studies will be correlated with research being conducted at Lockheed's Rye Canyon Solar Observatory.

"These objectives in themselves are not new," says Dr. Loren W. Acton, of Lockheed's Palo Alto Research Laboratory, and principal investigator on the heliometer experiment. "But in the past, experimenters have been limited by detection systems with less resolution and sensitivity. Now with this new flight package—and with the increased sophistication of the new OSO itself—we will be able to achieve far more definitive results. Translated into a daily x-ray map, these observations could be highly informative."

The Lockheed heliometer consists of three independent x-ray detection systems, and a data accumulator and processor, which prepares the collected information for the OSO transmission system. The detectors are mounted within the flight package on the rim of a wheel, which slowly scans the sun.

X-ray pulses from each of these three detection systems will be fed into 15 energy channels which span the range of x-ray energy being measured—in this case, from two to 30 KeV (thousand electron volts).

An analysis will be made of these pulse heights so as to compute the x-ray spectrum and intensity emanating from defined areas on the sun.

Because a better understanding of the sun's x-ray activity is of great interest to the scientific community, the production of a daily x-ray map by OSO-1 will be a valuable instrument for researchers. These maps will be distributed to other solar research groups, and to solar forecasting centres, providing an additional means for correlated solar studies.

The mapping x-ray heliometer is being developed under a three-year contract by Lockheed's space astronomy organisation, headed by Dr. Acton, staff scientist at the Research Laboratory. The experiment will make use of a number of previous studies conducted by this organisation.

OSO-1, scheduled for launch from Cape Kennedy in 1973, will look at the sun from an earth orbit of 300 miles. It is one of N.A.S.A's new Orbiting Solar Observatory series. Previous OSO satellites had pointing accuracies of 1/120th of a degree (30 arc seconds). The new series of OSO's will have pointing accuracies of 3 arc seconds—10 times better. OSO-1 will carry six other experiments in addition to the Lockheed mapping x-ray heliometer.

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I had hoped to publish the rules relating to membership of the Key Section in this issue of "A.R.," but there are still one or two details unresolved. It will therefore have to wait a little longer. We have made some progress, though, as the little picture at the head of the column shows.

The local contact-man for the Key Section will be the Divisional Co-ordinator. The State Co-ordinators appointed so far are:

Bill	VK2YB
Ivor	VK3XB
David	VK4DP
Pete	VK5FM
Lon	VK7LJ

VK6 are still working on the problem of finding someone. Ivor is being assisted in Victoria by Rus VK3KX. Bill is being assisted by VK2ANY and VK2ZNA.

So now you know the K/S has not vanished wholly into limbo. I will QRT until next time when I hope I can tell you what the whole thing is all about. 73, Deane VK3TX.

— . . . —

FEDERAL AWARDS

W.A.V.K.C.A. AWARD

The following Amateurs have received this Award during the period 1/7/70 to 30/6/71:

Cert. No.	Call	Cert. No.	Call	Cert. No.	Call
423	ZE1BP	445	WA2HSX	466	LA9CE
424	K4RDU	446	HF1JC	467	JA1SJV
425	OK1AHI	447	CR7IC	468	JA1AFF
426	ZS5LB	448	JA2CPD	469	F9MD
427	UW9PT	449	JA4CNS	470	JA6BRV
428	UB5WE	450	ZL2ACP	471	ZL2BCX
429	YV1KZ	451	VE3DEB	472	JA8ADQ
430	JA3IVA	452	JA3APV/1	473	ZL1AIZ
431	HB9AAA	453	JA1KYV	474	JA2EG
432	JA1HBC	454	K6GKU	475	K6SSN
433	ZL4OP	455	W3HQU	476	UA9BE
434	9Y4VV	456	W1EGT	477	VE3HJ
435	F3AT	457	UB5DW	478	JA8AWH
436	JA0AZE	458	UA4CD	479	JA3AAW
437	G3BDS	459	UW0IE	480	OE1MEW
438	6W8DY	460	UA3FF	481	VE6MJ
439	UB5ES	461	ZL2AYI	482	CT1UA
440	UA0IK	462	JA3HZT	483	F2NB
441	UA0MI	463	JA2ADH	484	K8YBU
442	KA9JC	464	JA2HNP	485	DL9TJ
443	F9LX	465	WA5KPL/ HR1		
444	JA6CUX				

COOK BI-CENTENARY AWARD

The following additional stations have qualified for the Award:

Cert. No.	Call	Cert. No.	Call	Cert. No.	Call
1364	AX2BFD	1370	G3AEU	1375	AX5ZU
1365	G3JVJ	1371	AX8DI	1376	G3ILO
1366	AX3ABR	1372	3B7DA	1377	AX5MF
1367	JA4REX	1373	OK2OQ	1378	AX2ASD
1368	CR7IK	1374	W0MLY	1379	AX2BYC
1369	G2AYQ			1380	AX3AER

Any persons still wishing to apply for the above Award are reminded that no further applications will be accepted after 31/12/71. The forwarding of any outstanding applications as soon as possible would be greatly appreciated.

W.I.A. 52 MHz. W.A.S. AWARD

New Member

Cert. No.	Call	Additional	Countries
96	VK7ZNR	—	

W.I.A. V.H.F.C.C.

Amendments

Cert. No.	Call	Confirmations 52 MHz.	144 MHz.
44	VK3AMK	174	—
46	VK3ZNJ	275	—
47	VK3ZNJ	—	302
73	VK3AMK	—	122

SILENT KEY

It is with deep regret that we record the passing of—

VK4WH—W. E. Hagarty

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FT-DX-100, A1 cond., $400. Eddystone EC10 Rovr., $150. Webster Bandspanner, plus High Gain spring, v.g.c., $50. URS7 Co-ax., low loss, 50 ohm, 25c per yard. Phone A.H. 548-3940 (Melbourne).

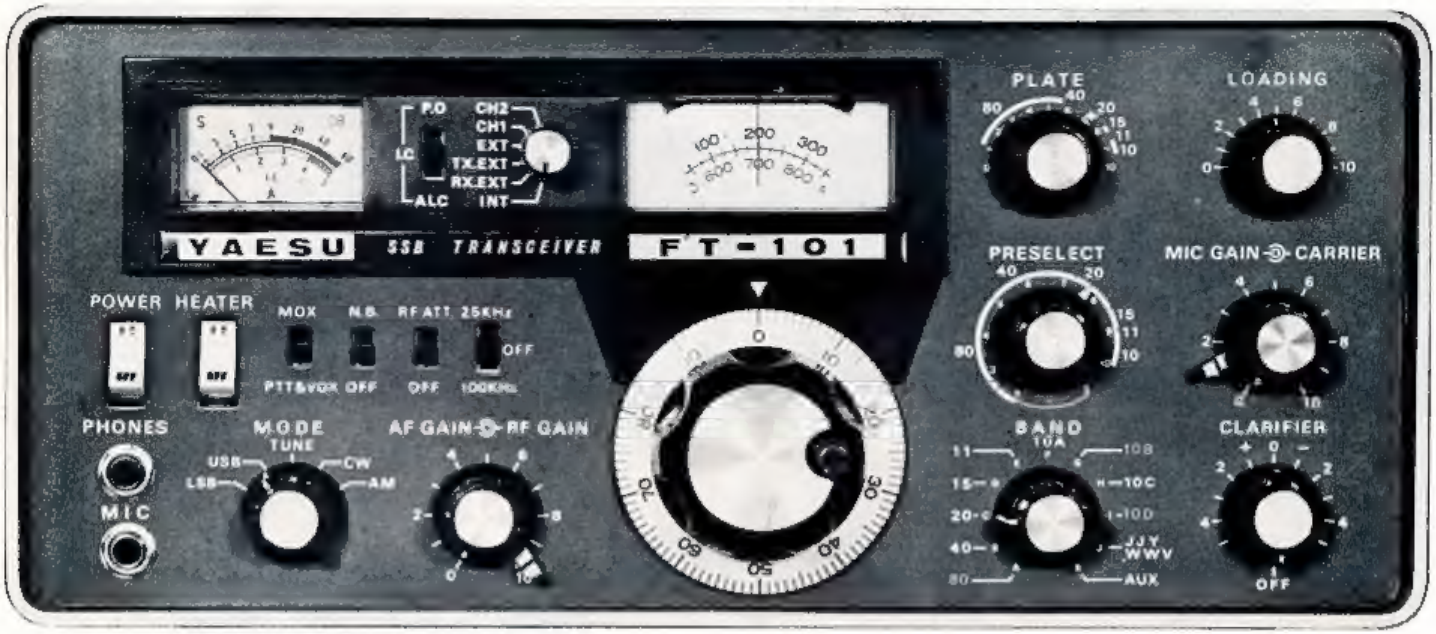
WANTED: Band-change motors and L-R Indicator drive transformers to suit 24 volt Bendix MN26 Radio Compass sets. Transformers are marked T16 or A15064. State price required. Also Vintage Radios complete with Horn Speaker, early 1920's, good price paid, send details. O'Brien, Edgar Rd., San Remo, Vic., 3925. Phone 107.

WANTED for Y.R.C.S. (Victorian Division): Out-of-date A.R.R.L. and R.S.G.B. Handbooks or similar publications for new Clubs that have been formed. This can assist potential Amateurs, so please clean out those dusty book shelves and forward to: K. J. McLachlan, Victorian Supervisor, Y.R.C.S. of Aust., P.O. Box 39, Moorooibark, Vic., 3138, or freight collect, Moorooibark Railway Station, Vic.

WANTED: Murphy British Naval VLF Receiver or similar type tuning down to 10 KHz. or lower. R. F. Fisher, VK3BAQ, 241 Royal Pde., Parkville, Vic., 3052. Phone [business hours) 340-5931.

WANTED: Receiver. Please state age, condition, price and any relavent details. Also Pye Mk. IIIA. mobile transceiver converted to 6 mx for sale, best offer. G. Hambling, VK5AS, 39 Tapleys Hill Rd., North Glenelg, Sth. Aust., 5045.

WANTED: Yaesu FT50 Transceiver. Full details to VK3ZN, J. McDonnell, 38 Herbert St., Parkdale, Vic., 3195.



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